PBC WAT LO 1986
Lake Okeechobee, Okeechobee
Waterway master plan - Phase 1,
Central and Southern Florida

Lake Okeechobee
Okeechobee Waterway
Master Plan

Phase 1

Central and Southern Florida Project

1986

US Army Corps
of Engineers
Jacksonville District

/

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

January 5, 1988

REPLY TO
ATTENTION OF

Planning Division
Environmental Resources Branch

TO ADDRESSEES ON THE ATTACHED LIST

Enclosed for your information and retention is the final copy of the Phase I Master Plan for the Central and Southern Florida Project, encompassing Lake Okeechobee and the Okeechobee Waterway.

Sincerely,

A. J. Salem

A. J. Salem
Chief, Planning Division

DISTRIBUTION OF APPROVED C&SF MASTER PLAN

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DEPARTMENT OF DEFENSE

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March 29, 1990

REPLY TO
ATTENTION OF

Planning Division
Environmental Resources Branch

TO ADDRESSEES ON THE ENCLOSED LIST

Enclosed for your information and retention is the Operational Facilities Supplement for insertion in the Phase I Master Plan for the Central and Southern Florida Project, encompassing Lake Okeechobee and the Okeechobee Waterway. A copy of the final Master Plan was originally forwarded in January 1988.

Sincerely,

A. J. Salem

A. J. Salem
Chief, Planning Division

Enclosure

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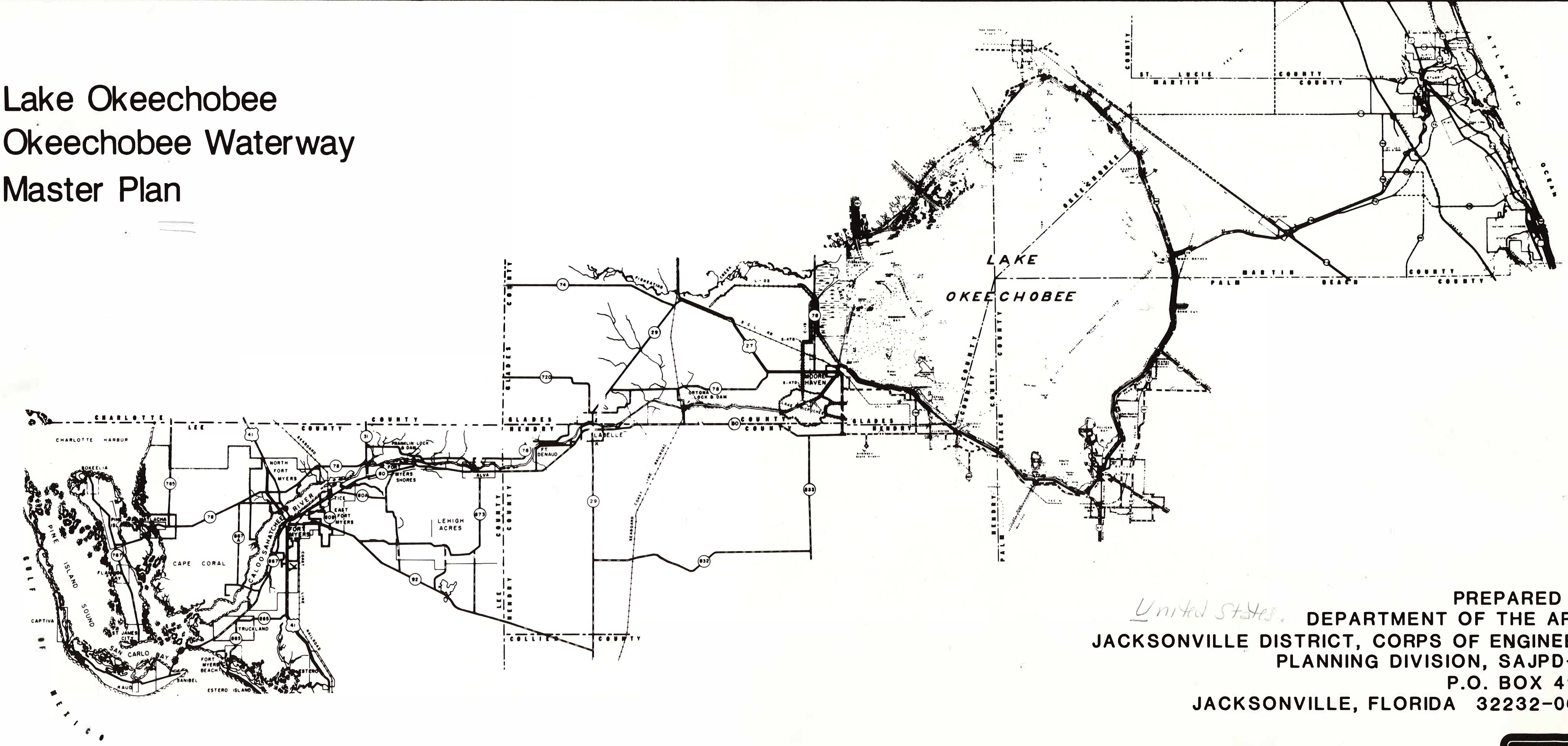
PBC

Phase 1

Central and Southern Florida Project

Lake Okeechobee
Okeechobee Waterway
Master Plan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ATLANTIC OCEAN
GULF OF MEXICO
ST. LUCIE COUNTY
MARTIN COUNTY
PALM BEACH COUNTY
OKEECHOBEE COUNTY
GLADES COUNTY
HENDRY COUNTY
CHARLOTTE COUNTY
LEE COUNTY
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CHARLOTTE HARBOR
PINE ISLAND SOUND
SAN CARLO BAY
CAPE CORAL
CALOOSAHATCHEE RIVER
NORTH FORT MYERS
FORT MYERS
EAST FORT MYERS
FORT MYERS SHORES
FORT MYERS BEACH
FRANKLIN LOCK & DAM
ALVA
LEHIGH ACRES
FT DENAUD
LABELLE
ORTONA LOCK & DAM
MOORE HAVEN
SANIBEL
CAPTIVA
ESTERO ISLAND
TRUCKLAND
JAMES CITY

United States.

PREPARED BY:
DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
PLANNING DIVISION, SAJPD-ER
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

1986

US Army Corps of Engineers
Jacksonville District

ADDENDUM

SEPTEMBER 1987

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

The following changes were made to the original text. Asterisks appear before and after the line or lines where revisions have been made. New pages should be inserted where noted.

Addendum:

Page i, ii

Insert New Pages.

Page iv

Insert New Page.

Page 1-2

* 1-4.14 ER 1105-2-20, 15 May 1985 (Change 1, 18 April 1986), Project Purpose Planning Guidance (Chapter * 6-Recreation), provides requirements for inclusion of recreation as a project purpose and guidance on the types of projects and facilities allowed with appropriate Federal and non-Federal participation.

Page 1-3

Insert New Page.

Page 2-4

* 2-3.7 Since the USGS began maintaining stage records * for Lake Okeechobee, the highest stage was 18.77 ft. recorded on 2 November 1947 and the lowest stage was 9.79 ft. recorded on 30 July 1981. The second highest recorded stage for the Lake occurred on 1 March 1983 * and was 18.26 ft. With the current schedule, the 30 day average peak lake stage expected to result from a 100 yr. storm is 21.6 ft. The 30 day average peak lake stage expected to result from a standard project flood is 24.8 ft. with a peak stage of 25.1 ft. *

* 2-3.8 In the '68 Project Authorization, raising the * Lake Okeechobee regulation schedule to allow storage of additional water to satisfy the increasing demands of south Florida was sanctioned. This raise would include a maximum conservation pool that fluctuates between elevations 19.5 and 20.5 ft. with an upper limit that fluctuates between elevations 20.5 and 21.5 ft. The authorized change in regulation schedule has not been implemented; however, this and other water supply alternatives are being addressed in the C&SF Water Supply Study.

Page 2-6

2-4.5 Fish and Wildlife Management. The resource staff maintains a close liason with the Florida Game and Fresh Water Fish Commission. They coordinate * maintenance of boat trails in the lake. Assistance is * provided in the installation of artificial reefs. A major aspect of this program is the management of aquatic plant control programs to the benefit of fish and wildlife populations. A management plan will be developed and coordinated in this regard.

2-5.2 The Lake is operated according to a seasonal regulation schedule which fluctuates between 15.5 and 17.5 feet. When the lake stage is within these established conservation pool levels, water is distributed by the South Florida Water Management District for water supply. When lake stages exceed these levels, the Corps of Engineers is responsible * for regulatory releases for flood control. *

2-5.5 The W.P. Franklin Lock has an experimental air * bubble curtain to decrease the salinity of the upstream freshwater supply by preventing entrance of higher concentrations of chloride into the lock * structure. Several minutes before the lock gates are opened, air is pumped through a special pipe set at the toe of the lock structure and the rising air * creates a barrier or curtain between the upstream and more saline downstream water. *

Page 2-7

2-6.4 The erosion process is generally uniform along the Canal and is expected to continue receding the banks at a rate of 1.6 feet per year. Several alternatives for shoreline protection are being studied to * correct this problem. A typical section of revetment protection for the Canal is illustrated in Figure 2F. * Shoreline protection may help both wildlife and aquatic life. Riprap would improve wildlife access to the water's edge. Vegetation could be planted at the upper and lower edges of the riprap which would provide food and cover to the smaller wildlife. Sessile organisms would attach to the rock and provide food for some aquatic life.

2-6.9 Structure Rehabilitation and Replacement. A rehabilitation and replacement program is administered in order to convert existing structures to meet con- * temporary needs brought about by changes in the * operating conditions and higher regulation levels authorized in 1968.

Page 2-9

2-9.9 Florida Game and Fresh Water Fish Commission is charged with exercising all the non-judicial powers of the State with respect to wild animals and fresh-water aquatic life. As part of its program on Lake Okeechobee, the Commission staff conducts fish population studies to assess the relative abundance of species, collects data through kreel surveys to determine estimates of sport fishing effort, harvest and success by species, and monitors the composition of the commercial fish harvest from the Lake. Activities on the Lake also include defining the areas open to com- * mercial fishing, coordination with the Corps on maintaining boat trails, management planning for aquatic plant control to benefit fish and wildlife, and migratory waterfowl and alligator surveys. The Commission * staff processes requests for hunting and fishing information and all permits and tags required for fresh water commercial and sport fishing and hunting. Commission Game and Fish Wildlife Officers enforce the State's hunting and fishing regulations on the Project.

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

Addendum (continued):

Page 2-10

Insert New Page.

Page 3-1

3-3.2 Historically, surface water in what is now the Orlando area on the northern end of the basin began as overland flow into the lakes and marshes of the upper Kissimmee Basin. Under relatively normal conditions, runoff was stored in the natural depressions and lakes. In years of heavy rainfall, surface water would overflow these depressions and move southward to ultimately reach Lake Okeechobee, joining runoff generated from lands adjacent to the Kissimmee River *Basin. Water levels in Lake Okeechobee typically would rise annually due to wet season inflow and, with* no major outlets, water would overflow the southern rim and gently flow overland into the Everglades and, to a much lesser extent, to the southwest toward Lake Hicpochee.

3-3.5 The entire hydrologic basin is now under the regulatory jurisdiction of the South Florida Water *Management District (SFWMD) and the Corps of Engineers. A highly complex system of drainage canals* and water control structures has been constructed to manage surface water. The major components of this system may be thought of as the Kissimmee River on the northwest, Lake Okeechobee in the center, numerous drainage canals to the south, the St. Lucie Canal to the east and the Caloosahatchee River to the west. The implementation of this system is part of a 100 year period of drainage and canal construction that has altered the hydrology of all of South Florida.

3-3.6 Lake Okeechobee plays an important role at the center of this system. It has been modified by a full century of construction to alleviate flooding problems. Prior to any attempt by the State or the Federal Government to control the water level and to drain the Everglades, Lake Okeechobee had a normal elevation of about 20.5 feet above sea level and a normal fluctuation of 2.5 feet. Originally, when the Lake's water surface was at 20.5 feet, the major portion of the vast Everglades area to the southeast of the Lake was under water. The Lake is now diked to allow considerable storage and a series of structures allow water to flow either in or out through numerous outlets. Lake levels are controlled under a schedule placed into effect during May 1978. The schedule varies the levels between elevation 15.5 and 17.5 ft. *Under normal conditions the lake level is drawn down to elevation 15.5, in advance of the hurricane season.* The drawdown begins on the first of January and is complete by the first of June. The water surface is then allowed to rise to elevation 16.5 by mid-September and 17.5 by the end of September where it is held until the first of January.

Page 3-2

3-3.9 The St. Lucie Canal releases water from Lake Okeechobee. Unlike the Caloosahatchee River, the Canal does not have additional, extensive drainage basins. Canal flows are highly regulated by means of gated control structures adjacent to the Port Mayaca Lock and St. Lucie Lock. Records of flows at the St. Lucie Lock over a 30 year period show a range from *17,000 cubic feet per second to periods of zero flow except for leakage and lockage lasting two to three months. *

Page 3-3 and 3-4

3-8.5 Lake Okeechobee Region. The vegetation that now exists on Lake Okeechobee has developed in response to the Lake's confinement and regulation. It is considerably different from the vegetation of the lake area at the turn of this century. A version of a vegetation map prepared in 1914 is shown in Figure 3A. * In 1914, there was a dense custard apple forest that * formed a swampy, irregular shore along the southern shoreline and partially up each side of the Lake. This custard apple belt varied in width from about a mile to 8 miles. Narrow extensions of the Everglades vegetation existed on the eastern and western shores, north of the custard apple forest. Dense cypress groves were extant behind low sand ridges on the very northern shoreline. The islands in the Lake; Observation, Ritta, Kreamer, and Torry, were covered with dense groves of custard apple, cypress, ash and willow.

Page 3-6

3-9.4 The first study specifically aimed at documenting the fish fauna of Lake Okeechobee was conducted from 1967 to 1969. Forty-three species were identified, of which 36 were true fresh-water fishes and seven were marine species which invade fresh water. The strictly fresh-water species were of widespread occurrence in peninsular Florida. Seven species of marine fishes collected in the Lake were: Atlantic needlefish, striped mullet, clown goby, hogchocker, snook, ladyfish, and tarpon. By 1974, the walking catfish was recognized as established in the Lake. * Recent records also show the presence of breeding populations of two exotic fishes: the black acara and the blue tilapia. *

3-9.5 Lake Okeechobee supports a large commerical and sport fishery which has been regulated by the Florida Game and Fresh Water Fish Commission since 1947. The mainstay of the commercial fishery includes four * species of catfish, blue gill, and redear fish. Several of these are important in sport fishing, which also includes chain pickerel, black crappie ("speck"), * and largemouth bass. There is limited sport fishing for snook and tarpon in Lake Okeechobee. In Florida, the snook is a species of special concern because of their diminishing numbers.

3-9.10 Lake Hicpochee represents a special case along the River where extensive littoral habitat is available immediately adjacent to the Waterway. According to the 1967 report by the Florida Game and Fresh Water Fish Commission, fish populations are inadequate there and could be greatly improved by raising the water level. This would increase populations of bream and * bass. Careful management could also improve migratory waterfowl and wading bird habitat. *

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

Addendum (continued):

Page 6-2

6-2.3 The majority of boating activity on the Lake is fishing oriented. Figure 6C illustrates the areas on the Lake where fishing by boat is concentrated. Fishing by boat is concentrated in the areas of emergent vegetation, and there is little competition with commercial fishing. The boat launching sites are shown in Figure 6D and the intensity of use at the various launching facilities is noted as either high, medium or low. This intensity of use is dependent not only on proximity to good fishing areas but on the general condition of facilities and their proximity to population centers. Lockage data in Figure 6E from the small boat locks operated by the SFWMD show that the period of highest boating activity on the Lake occurs during the winter/spring season. This corresponds to increases in fisherman success due to the spawning of crappie and bream and to increases in the numbers of tourists in the area. Year-round boating on the Lake, but at periodi- * cally low levels, can be attributed to sport fishing and some hunting. *

Figures 6C and 6D Revised as shown.

Figure 6C

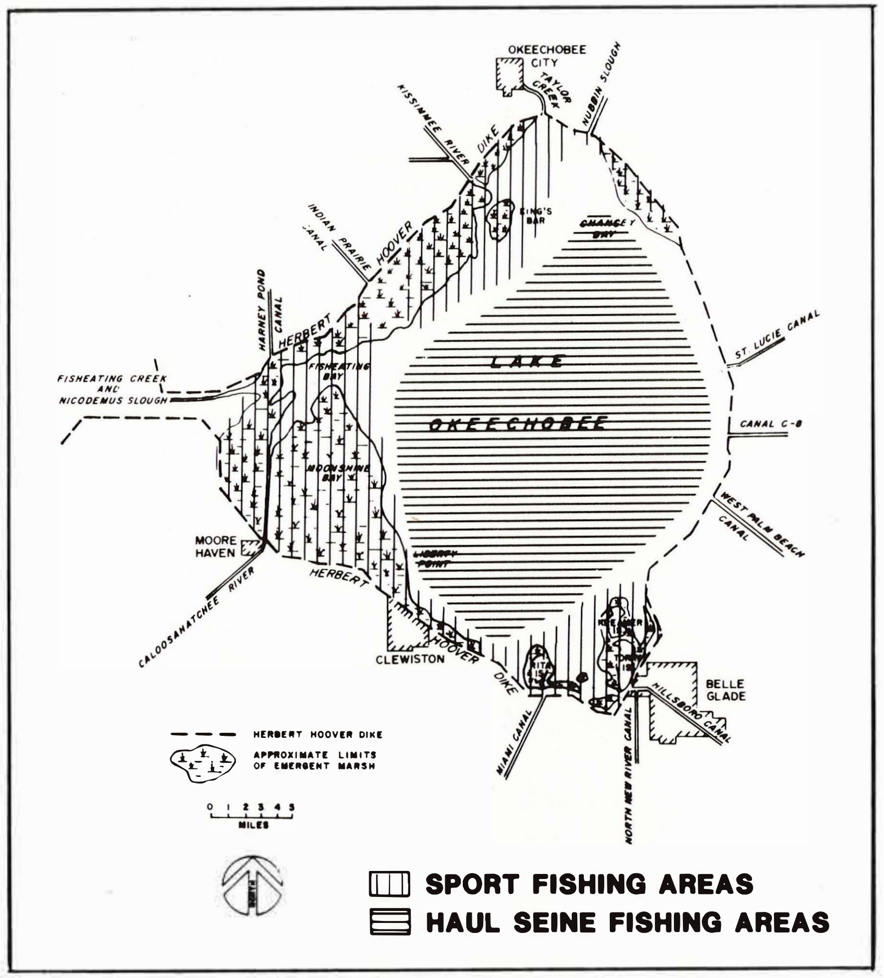
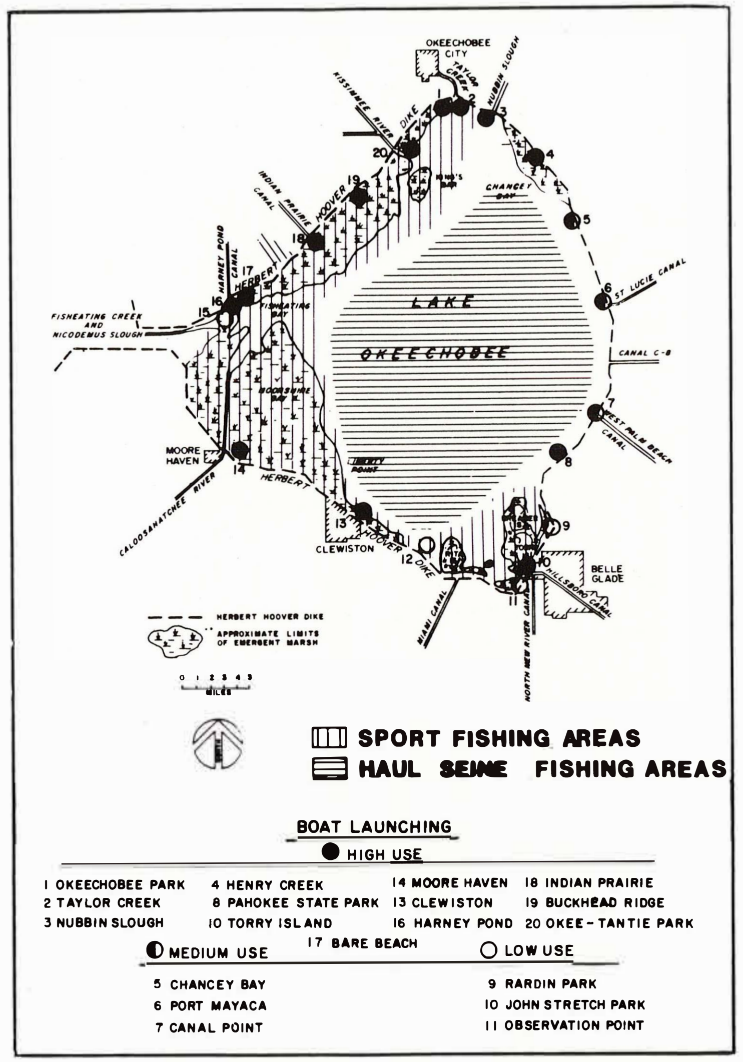

OKEECHOBEE CITY
TAYLOR CREEK
NUBBIN SLOUGH
KISSIMMEE RIVER
DIKE
KING'S BAR
CHANCEY BAY
INDIAN PRAIRIE CANAL
HOOVER
HARNEY POND CANAL
HERBERT
FISHEATING BAY
ST. LUCIE CANAL
FISHEATING CREEK AND NICODEMUS SLOUGH
LAKE
OKEECHOBEE
CANAL C-8
MOONSHINE BAY
WEST PALM BEACH CANAL
MOORE HAVEN
CALOOSAHATCHEE RIVER
HERBERT
LIBERTY POINT
CLEWISTON
HOOVER
DIKE
BELLE GLADE
HILLSBORO CANAL
MIAMI CANAL
NORTH NEW RIVER CANAL
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5
MILES
SPORT FISHING AREAS
HAUL SEINE FISHING AREAS

Figure 6C

Figure 6D


OKEECHOBEE CITY
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MIAMI CANAL
NORTH NEW RIVER CANAL
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APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5
MILES
SPORT FISHING AREAS
HAUL SEINE FISHING AREAS
BOAT LAUNCHING
● HIGH USE
1 OKEECHOBEE PARK
2 TAYLOR CREEK
3 NUBBIN SLOUGH
4 HENRY CREEK
8 PAHOKEE STATE PARK
10 TORRY ISLAND
17 BARE BEACH
14 MOORE HAVEN
13 CLEWISTON
16 HARNEY POND
18 INDIAN PRAIRIE
19 BUCKHEAD RIDGE
20 OKEE-TANTIE PARK
◐ MEDIUM USE
5 CHANCEY BAY
6 PORT MAYACA
7 CANAL POINT
○ LOW USE
9 RARDIN PARK
10 JOHN STRETCH PARK
11 OBSERVATION POINT

Figure 6D

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

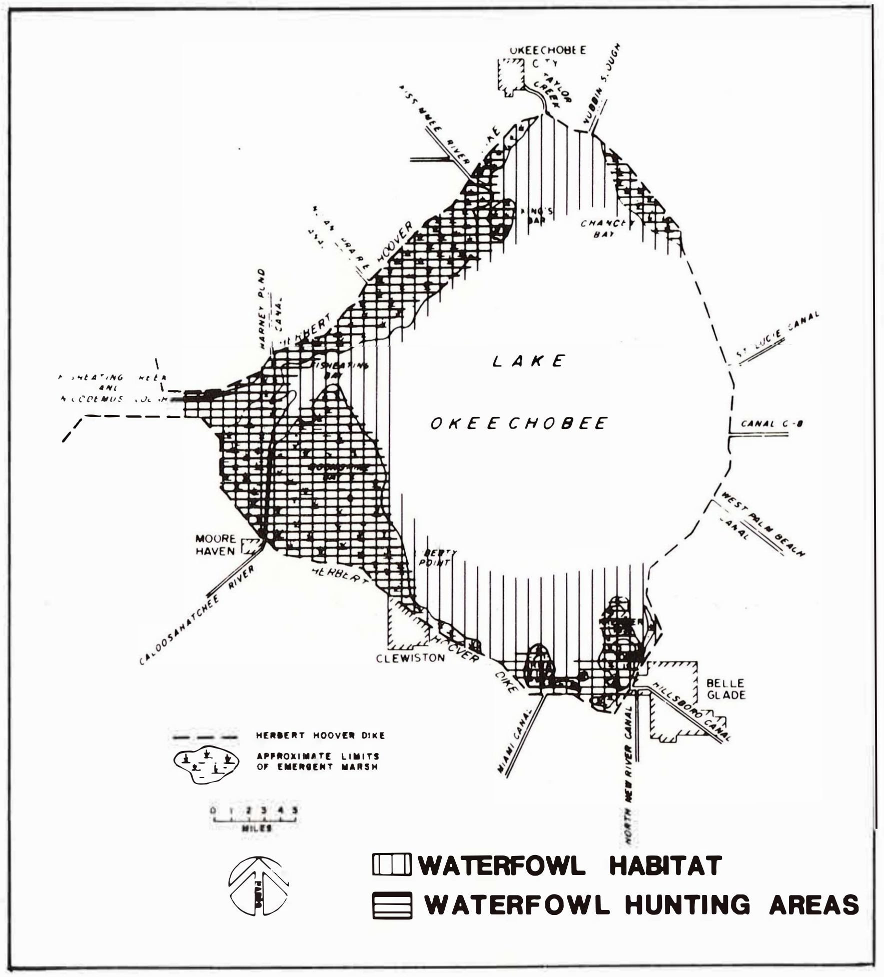
Addendum (continued):

Page 6-3

6-5 Hiking and Bicycling Trails.

√ 6-5.1 Facilities for hiking are limited on the project. The Corps has a 1.5 mile nature trail located on the north side of the St. Lucie Recreation Area. A brochure is provided for self-guided interpretation, and the trail is heavily used by campers, day-users and various school groups. A segment * of the proposed Florida National Scenic Trail, a cross- * country hiking trail extending from the Everglades to Blackriver State Park near Pensacola, is located on the dike on the southern and eastern shoreline of Lake Okeechobee, as shown in Figure 6H. On the project it is interrupted along the dike by fences, canals, and water control structures so hikers must leave the dike and walk out to main roads periodically. A preferred trail corridor following the dike on the western and northern shoreline has been identified in the U.S. Forest Service's Comprehensive Plan for the Florida Trail (Draft, 1986). This route passes some of the more scenic areas on the Lake, where the marshes support greater quantities of wildlife.

√ Page 6-4, Figure 6I
Figure revised as shown.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HOOVER
DIKE
CLEWISTON
MIAMI CANAL
NORTH NEW RIVER CANAL
HILLSBORO CANAL
BELLE GLADE
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5
MILES
WATERFOWL HABITAT
WATERFOWL HUNTING AREAS

Figure 6I

Page 8-1

√ 8-1.2 Resource Use Objectives are listed below. They have been organized in categories: environmental quality, fish and wildlife, cultural resources, planning and implementation, and recreation. They are also discussed by geographic area. More specific objectives for particular recreation sites are included in the discussions in Chapter 10 of the * Conceptual Development Plans. More specific resource management practices that would be implemented in support of the following objectives are included in Chapter 11, Resource Management Guidelines. *

Add after 8-2.1D.

√ *E. Consider environmental quality in the design or renovating of facilities.

Discussion: Use of up-to-date information and state of the art techniques should be the first step in determination of proper design considerations of projects. Boat ramps should have catchment basins that direct oily bilge water into subsurface drain fields instead of into the river or lake. Careful evaluation of chemically treated timbers and other materials should be made to allow selection of materials that are the least harmful to the environmental quality of the river and lake. *

8-2.2

√ B. Replace exotic tree species with native species *that require minimal supplemental watering and fertilizer in all recreation areas during construction or operations and maintenance. *

Discussion: Existing trees in many recreation areas are the result of early tree planting programs on the levee. Several problems with these exotic species warrant their removal; however, they have considerable positive benefit in recreation areas in providing shade, visual interest and attracting wildlife.

Page 9-1

√ 9-2.1 The Land Management Classifications defined below were established to classify project lands based on criteria in Corps of Engineers Planning Regulations, * ER 1120-2-400. The following definitions describe the * desirable management function of each classification and some of the activities and uses compatible with the intention of that classification. Classification definitions may be expanded or modified as the project develops.

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

Addendum (continued):

Chapter 10
Pages 10-5 through 10-7
Insert New Pages 10-5 through 10-7.

Plate X of 10
Insert New Page.

Plates 1-10
Insert Site Analysis Maps,
Plates 1A-10A, before each area's
Conceptual Development Plan.

Plates 11 and 11A
Insert New Pages.

Page 11-1

11-1.1 One of the goals for a Corps of Engineers project is to create greater awareness and understanding of the project's purposes, benefits, natural resources, and its cultural, historical, and archeological features. A lack of awareness or misunderstanding of project purposes could generate conflicts between management and the visiting public. These conflicts could result in an uninformed public and in situations which could be hazardous to users. Lock operations, unstable banks, unmarked channels and unmarked fish habitats are only several situations where a lack of knowledge could present a serious safety problem. Degradation and vandalism of project resources is often the result of disrespect which could be prevented through an increased public awareness of the value of available recreation * resources. Specific site design and management details not discussed in this Master Plan will be addressed in future Feature Design Memoranda and/or the Operational Management Plan. *

11-2.4 Project signs will be installed in accordance with the "Manual on Uniform Traffic Control Devices", U.S. Department of Transportation; "Graphic Standards * Manual", EP 310-1-6. *

Page 11-3
11-8.3, Table 11A

An asterisk should be added to the following 4 species to indicate indigenity to Florida.

Large Trees

Sweet Bay	*Magnolia virginiana
Water Oak	*Quercus nigra

Shrubs

Gallberry	*Ilex glabra

Grasses

Saltmeadow Cordgrass	*Spartina patens

Add to end of Table 11A.

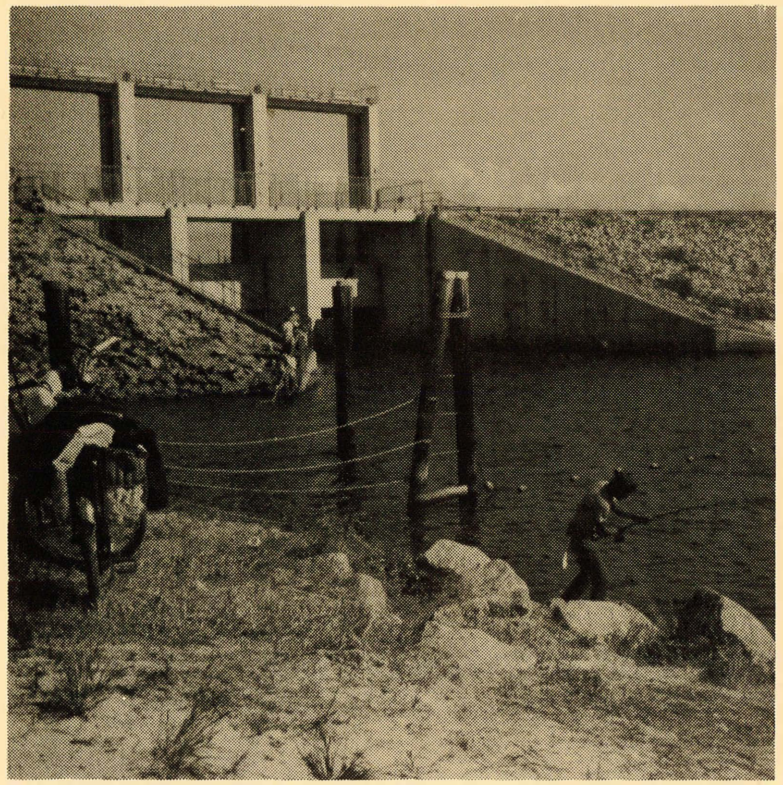
*Additionally, the following tropical species should be noted for cold sensitivity in varying degrees that may result in freeze kill or damage: mastic tree, mahogany, Florida silver palm, Florida royal palm, Florida thatch palm, sea grape, and red mangrove. *

Page 11-4, ADD.

* 11-16 OPERATIONAL MANAGEMENT PLAN

11-16.1 The project's Operational Management Plan (OMP) is an action document that describes in detail how the proposed concepts in the Master Plan will be implemented. The resource management guidelines in this chapter establish important criteria that will be expanded in the OMP. *

NOTE: APPENDIX A - Public Review Comments and Responses - pages A-1 - A-12 - has been added to this final version of the Master Plan.



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PREFACE

"In past years, emphasis has been placed on minimum development required for hunting and fishing access to project waters, while features and facilities required for rapidly increasing general recreation activities have largely been neglected. This has resulted in recreational visitation far in excess of the carrying capacity of existing facilities. It is, therefore, considered essential that existing recreation areas be expanded insofar as practicable, that additional areas be acquired and that appropriate areas be developed to desirable quality standards for general as well as for fish and wildlife recreation. Proposed project improvements will afford unique opportunities to accomplish those objectives and assist in meeting projected public demands for quality outdoor recreational opportunities."

That paragraph was written in the introduction of a 1967 Preliminary Recreation Plan (Survey-Review Report-Water Resources for C&SF, Appendix H). Almost twenty years later the general situation regarding recreation resources in the project area is about the same. Although public and private recreation facilities have been constructed since 1967, the existing supply has not kept pace with increasing public demands. A number of facilities are in need of repair and expansion. Lands adjacent to the project's waterways are quickly being converted to commercial and private uses resulting in greater public pressure * on public lands. A concerted effort will be required for appropriate coordination between Federal and State Agencies and other public entities to accomplish some of the objectives stated in the 1967 report and to implement the proposed development in the Master Plan. *

The Master Plan provides general direction for land use planning and resource management and development. It is used by the Corps of Engineers for guidance in its stewardship role to manage resources in the broad public interest. It seeks to:

- promote protection, conservation, and enhancement of important resources including natural, cultural and man-made.
- assure a balance between the competition for public and private use of available land and water resources.
- coordinate national, regional, state and local objectives.

Specific design and management details, not dealt with here, will be the subject of future Feature Design Memoranda or the Operational Management Plan.

This Master Plan uses the planning criteria and recommended plan format described in the Corps' Engineering Regulations, ER 1120-2-400, "Investigation, Planning and Development of Water Resources: Recreation Resources, Planning, Design and Management" and SADvR 1110-2-10, "Recreation Resources Planning, Engineering and Design." The plan is prepared in five parts.

Part I describes the scope of the Central and Southern Florida Project and the Corps' overall involvement in developing, operating and maintaining project infrastructure and in managing the associated resources. In addition, the responsibilities of other agencies participating in project development and resource management are included.

Part II consists of an inventory of cultural and natural resources to assist in establishing the setting for plan recommendations.

Part III evaluates both current and future recreation use of project resources. It examines the existing supply of recreation facilities, resource carrying capacity, and estimated facility needs.

Part IV presents the combined recommendations of the planning analysis, public input, and agency coordination. These recommendations are organized into four formats; the Resource Use Objectives, the project-wide Land Management Classification Plans, the Conceptual Development Plans for specific recreation areas, and the Resource Management Guidelines.

Part V discusses the coordination required for plan implementation and future study needs.

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* APPENDIX A - PUBLIC REVIEW COMMENTS AND RESPONSES

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A-1 Board of County Commissioners, Martin County, February 25, 1987. Department of Natural Resources, Tallahassee, March 11, 1987.
A-2 South Florida Water Management District, March 5, 1987.
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A-5 - A-8 Florida Game and Fresh Water Fish Commission, March 23, 1987 (with Attachment II).

Section 2 - RESPONSES TO PUBLIC REVIEW COMMENTS
Pages A-9 Through A-12 *

PROJECT DATA

PROJECT DATA:

NAVIGATION CHANNELS Water system	WATER SURFACE *1	AUTHORIZED PROJECT DIMENSIONS WIDTH/DEPTH *2/LENGTH	CONTROLLING CHANNEL DEPTHS FEET N.G.V.D *3
St. Lucie Canal			
Intracoastal Waterway to St. Lucie Lock		80'/8'/15.1 miles	-0.1
*4 St. Lucie Lock to Port Mayaca Lock	440 Acres	100'/8'/23.7 miles	12.56
Lake Okeechobee (15.5 Ft. N.G.V.D.)	450,000 Acres		
Port Mayaca Lock to Clewiston via open Lake		100'/8'/26.2 miles	12.56
Port Mayaca Lock to Clewiston via Rim Canal		80'/6'/37.0 miles	12.56
Clewiston to Moore Haven Lock		90'/8'/13.0 miles	12.56
Caloosahatchee River			
Moore Haven Lock to Ortona Lock	601 Acres	90'/8'/15.5 miles	10.06
*4 Ortona Lock to W.P. Franklin Lock	1,353 Acres	90'/8'/27.9 miles	.88
W.P. Franklin Lock to Beautiful Island RR Bridge		90'/8'/8.5 miles	.88
Beautiful Island RR Birdge to Punta Rassa		100'/10'/20.9 miles	.88
Punta Rassa to Gulf of Mexico		200'/12'/3.8 miles	.88
Taylor Creek			
Taylor Creek Lock to town of Okeechobee		60'/6'/4.8 miles	12.56

*1 Approximate
*2 Depth Based on Lake Datum stage of 12.56 feet N.G.V.D.
*3 National Geodetic Vertical Datum (Mean Sea Level of 1929).
*4 Limits of Phase I, Master Plan Study Area. Total Length of Waterway (Study Area) - 106.3 miles via open lake; 117.1 miles via Rim Canal. Total Length of Waterway (Coast to Coast) - 154.6 miles via open lake; 165.4 miles via Rim Canal.

LEVEES

Herbert Hoover Dike *1	Location	Length	Elevation *2	Lakeside Slope *3	Landside Slope *3
L-D9	Port Mayaca To Bacom Point	15.0 miles	37.0 to 38.3 feet	1:6	1:3 & 1:5
L-D2	Bacom Point to Clewiston	23.0 miles	35.5 to 45.6 feet	1:6	1:3
L-D1	Clewiston to Moore Haven	10.6 miles	34.5 to 38.7 feet	1:6	1:3
L-D3	Moore Haven and Westward along Fisheating Creek	14.5 miles	34.7 to 37.5 feet	1:6	1:3
L-43	West end of L-D3 Tieback Levee	1.0 mile	21.2 feet	1:6	1:3
L-50	North & Eastward along Fisheating Creek to Harney Pond Canal *4	12.5 miles	32.3 to 39.0 feet	1:6	1:2 & 1:4
L-49	Harney Pond Canal to Indian Prairie Canal *4	11.0 miles	32.3 to 39.0 feet	1:6	1:2 & 1:4
L-48	Indian Prairie Canal to Kissimmee River *4	8.2 miles	32.3 to 39.0 feet	1:6	1:3
L-D4	Kissimmee River to Nubbin Slough *4	15.7 miles	34.4 to 41.1 feet	1:6	1:3
L-47 Sect. 1&2	Nubbin Slough to Chancey Bay *4 (Sect. 2) Chancey Bay to Port Mayaca (Sect. 1)	17.9 miles	36.7 to 39.3 feet	1:6	1:3 & 1:4

LEVEES ADJOINING THE HERBERT HOOVER DIKE SYSTEM (Landside)

L-10	Along West Palm Beach Canal	10.3 miles	18.5 to 20.0 feet	-	1:3
L-14	Along Hillsboro Canal	9.4 miles	17.3 to 17.5 feet	-	1:3
L-20	Along North New River Canal	-	17.5 to 20.0 feet	-	1:3
L-25	Along Miami Canal	6.5 miles	18.4 feet	-	1:3
L-63 (N)	Along Nubbin Slough	5.6 miles	26.5 to 29.7 feet	-	1:3
L-63 (S)	Along Nubbin Slough	4.5 miles	26.5 feet	-	1:3
L-41	From L-D3, South of Fisheating Creek	1.0 mile	21.2 feet	-	1:3

*1 Crown Width Typical 10 Ft. (L-D9 is 10 to 20 Ft.)
*2 N.G.V.D.
*3 In feet; Vertical: Horizontal
*4 Levee continues northward along the River or Canal

CANALS	Local Name	Length	Bottom Elevation *
L-8 Canal	Canal at Culvert 10A	25.6 miles	+7.0 to -2.0 feet
Canal 21	Canal west of Clewiston Recreation Area's Ramp	4.5 miles	+2.0 feet
Canal 20	From pump station 4	11.6 miles	-8.0 to +2.0 feet
Canal 43	Caloosahatchee River	52.8 miles	-24.0 to -5.0 feet
Canal 41	Harney Pond Canal	28.1 miles	-13.0 to +16.7 feet
Canal 40	Indian Prairie Canal	18.1 miles	-4.7 to +10.1 feet
Canal 38	Kissimmee River	58.3 miles	-14.0 to +18.0 feet
Canal 59	Nubbin Slough	1.6 miles	-1.7 to +6.0 feet

NAVIGATION LOCK STRUCTURES

Lock (Structure Number)	Management *1	System *2	Width/Length	Sill Elevations *3	Hours of Operation	Constructed
St. Lucie Lock (S-80)	COE	C	50'/250'	-1.23/-12.70 feet	6:00 AM - 10:00 PM Daily	1941
Port Mayaca Lock (S-308 B)	COE	C/L	56'/400'	-1.50/-1.50 feet	6:00 AM - 10:00 PM Daily	1977
Clewiston Lock (S-310) *4	SFWMD	L	50'/60'	+2.56/+2.56 feet	5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Moore Haven Lock (HGS-1)	COE	L/R	50'/250'	+2.56/-0.94 feet	6:00 AM - 10:00 PM Daily	1935
Fisheating Creek Lock (S-131) *5	SFWMD	L	15'/50'	+8.0 feet	5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Buckhead Ridge Lock (S-127) *5	SFWMD	L	15'/50'	+8.0 feet	5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Taylor Creek Lock (S-193) *4	SFWMD	L	50'/60'	+5.50/+5.50 feet	5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Henry Creek Lock (G-36) *5	SFWMD	L	15'/50'		5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Chancey Bay Lock (S-135) *5	SFWMD	L	15'/50'	+8.0 feet	5:30 AM - 8:00 PM (9:00 PM - May 1 to Sept 30)	
Ortona Lock (S-78)	COE	R	50'/250	-1.94/-12.44 feet	6:00 AM - 10:00 PM Daily	1937
W.P. Franklin Lock (S-79)	COE	R	56'/400'	-14.00/-14.00 feet	6:00 AM - 10:00 PM Daily	1965

*1 COE - Corps of Engineers, SFWMD - South Florida Water Management District
*2 C-St. Lucie Canal; L-Lake Okeechobee; R-Caloosahatchee River
*3 Upper/Lower Sills
*4 Modified Hurricane Gates: HG-2 Clewiston; HG-6 Taylor Creek
*5 For small boat access from the Lake to the Borrow Canal

WATER CONTROL STRUCTURES

Hurricane Gates	Width	Depth Over Still	Nearest Community	Constructed
HGS-5 on West Palm Beach Canal	50'	+2.56 Ft.	Canal Point	1935
HGS-4 on Hillsboro & North New River Canal (S-351) *1	50'	+2.56 Ft.	Belle Glade	1935 (To be replaced, late 1980's)
HGS-3 on Miami Canal	50'	+2.56 Ft.	Lake Harbor	1935
HGS-2 on Industrial Canal (S-310) *3	50'	+2.56 Ft.	Clewiston	1935 (Modified - 1977)
HGS-1 on Caloosahatchee River *2 & 3	50'	+2.56/-0.94 Ft. *4	Moore Haven	1935
HGS-6 on Taylor Creek (S-193) *3	50'	+5.50 Ft.	Okeechobee	1936 (Modified - 1970)

*1 Plans underway to replace with spillway structure
*2 Managed by Corps of Engineers
*3 Lock Structures
*4 Upper/Lower Sill.

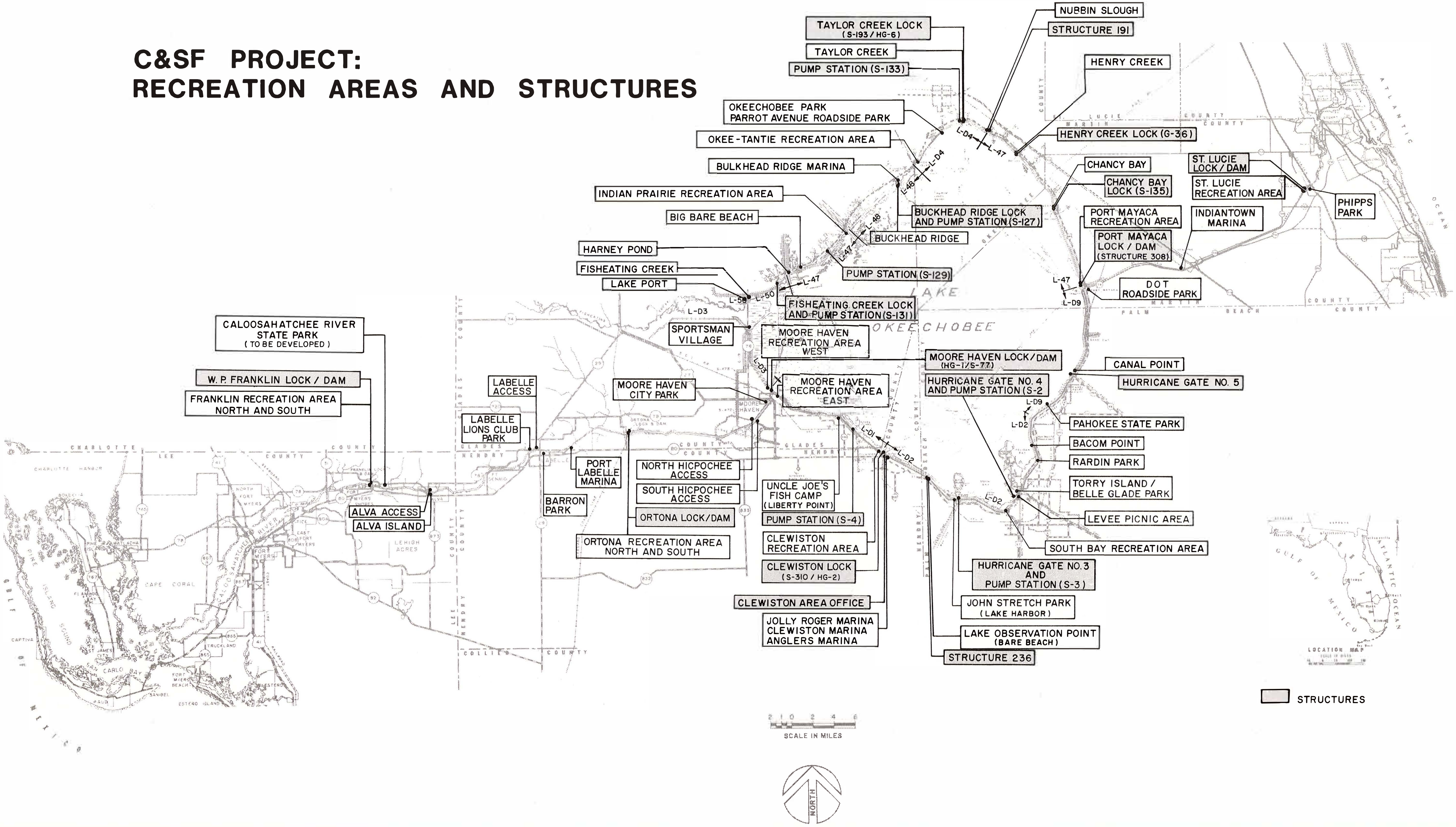
Pump Stations *	Location	Levee
S-2	Adjacent to HGS-4 on Hillsboro & North New River Canals	L-D2
S-3	Adjacent to HGS-3 on Miami Canal	L-S2
S-236	At Little Bare Beach (Lake Observation Point)	L-D2
S-4	West of Liberty Point on Canal 21	L-D1
S-131	At Lakeport	L-50
S-129	West of Indian River Canal	L-49
S-127	West of Buckhead Ridge Lock	L-48
S-133	West of Taylor Creek	L-D4
S-135	North of Chancey Bay	L-47, Sect. 2

* Managed by SFWMD

Spillways	Location
S-308C	Adjacent to Port Mayaca Lock
S-77	Adjacent to Moore Haven Lock
S-191	At Nubbin Slough
S-80	Adjacent to St. Lucie Lock
S-78	Adjacent to Ortona Lock
S-79	Adjacent to W.P. Franklin Lock

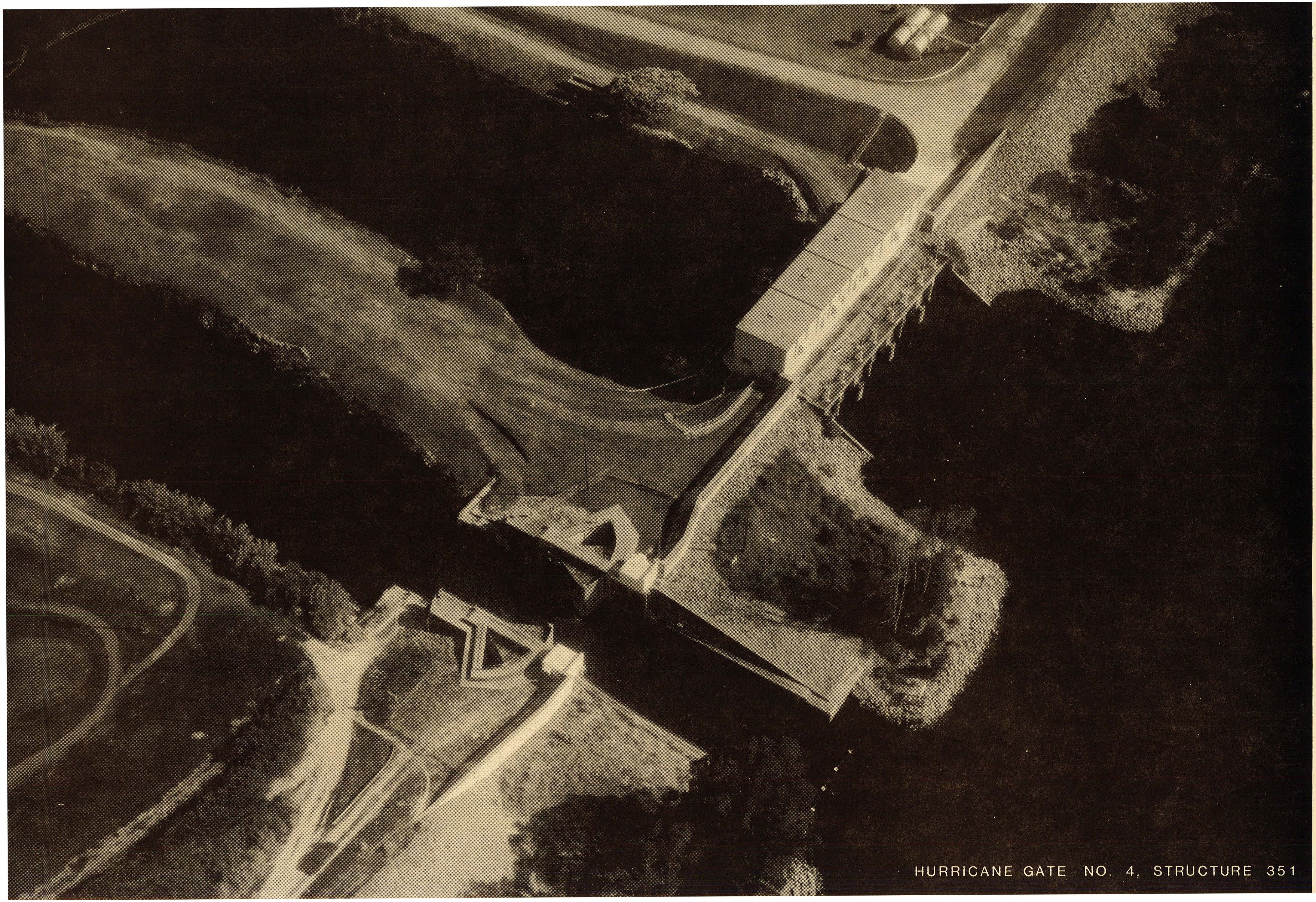
Culverts	No. Barrels/Dia. Ft.	Control	Levee
C-11	1/10	Pump, slide gates	L-D9, North of Palm Beach County Line
C-16	1/10	Slide gate	L-D9, South of Martin County Line
C-14	1/10	Slide gate	L-D9, North of C-10A
C-10A	5/10	1 slide & 4 flap gates	L-D9, Canal North of Macedonia Church
C-13	1/10	Slide gate	L-D9, South of C-10A
C-10	2/10	Pumps, slide & flap gates	L-D2, Bacom Point
C-12A	1/7	Pump, slide gates	L-D2, Bacom Point Recreation Area
C-12	3/10	Pump, 1 slide gate & 2 flap gates	L-D2, Rardin Park
C-4A	1/10	Pump, slide gate	L-D2, South Bay Recreation Area
C-3	2/10	Pump, slide gate	L-D2, Lake Observation Point
C-2	6/10	Flap gates	L-D1, Clewiston Recreation Area
C-1A	3/10	Pump, vertical screw gates	L-D1, West of Liberty Point
C-1	2/10	Pump, flap gates	L-D1, East of Moore Haven Recreation Area
C-5A	3/10	1 slide & 2 flap gates	L-D3, Northwest of Moore Haven Recreation Area
C-5	3/10	1 slide & 2 flap gates	L-D3, North of C-5A
C-7	3/10	1 slide & 2 flap gates	L-D4, At Eagle Bay
C-8	3/10	1 slide & 2 flap gates	L-D4, North of C-9
C-9	3/10	1 slide & 2 flap gates	L-D4, North of Nubbin Slough

C&SF PROJECT: RECREATION AREAS AND STRUCTURES


TAYLOR CREEK LOCK (S-193 / HG-6)
TAYLOR CREEK
PUMP STATION (S-133)
NUBBIN SLOUGH
STRUCTURE 191
HENRY CREEK
OKEECHOBEE PARK
PARROT AVENUE ROADSIDE PARK
OKEE-TANTIE RECREATION AREA
HENRY CREEK LOCK (G-36)
BULKHEAD RIDGE MARINA
CHANCY BAY
CHANCY BAY LOCK (S-135)
ST. LUCIE LOCK / DAM
ST. LUCIE RECREATION AREA
PHIPPS PARK
INDIAN PRAIRIE RECREATION AREA
BUCKHEAD RIDGE LOCK AND PUMP STATION (S-127)
PORT MAYACA RECREATION AREA
INDIANTOWN MARINA
BIG BARE BEACH
BUCKHEAD RIDGE
PORT MAYACA LOCK / DAM (STRUCTURE 308)
HARNEY POND
FISHEATING CREEK
PUMP STATION (S-129)
LAKE PORT
DOT ROADSIDE PARK
FISHEATING CREEK LOCK AND PUMP STATION (S-131)
L-D4
L-47
L-48
L-50
L-59
L-D3
L-D9
L-D1
L-D2
CALOOSAHATCHEE RIVER STATE PARK (TO BE DEVELOPED)
SPORTSMAN VILLAGE
MOORE HAVEN RECREATION AREA WEST
LAKE OKEECHOBEE
MOORE HAVEN LOCK / DAM (HG-1 / S-77)
CANAL POINT
W. P. FRANKLIN LOCK / DAM
HURRICANE GATE NO. 4 AND PUMP STATION (S-2)
HURRICANE GATE NO. 5
FRANKLIN RECREATION AREA NORTH AND SOUTH
LABELLE ACCESS
MOORE HAVEN CITY PARK
MOORE HAVEN RECREATION AREA EAST
PAHOKEE STATE PARK
LABELLE LIONS CLUB PARK
BACOM POINT
RARDIN PARK
PORT LABELLE MARINA
NORTH HICPOCHEE ACCESS
UNCLE JOE'S FISH CAMP (LIBERTY POINT)
TORRY ISLAND / BELLE GLADE PARK
SOUTH HICPOCHEE ACCESS
BARRON PARK
ALVA ACCESS
ALVA ISLAND
ORTONA LOCK/DAM
PUMP STATION (S-4)
LEVEE PICNIC AREA
CLEWISTON RECREATION AREA
SOUTH BAY RECREATION AREA
ORTONA RECREATION AREA NORTH AND SOUTH
CLEWISTON LOCK (S-310 / HG-2)
HURRICANE GATE NO. 3 AND PUMP STATION (S-3)
CLEWISTON AREA OFFICE
JOHN STRETCH PARK (LAKE HARBOR)
JOLLY ROGER MARINA
CLEWISTON MARINA
ANGLERS MARINA
LAKE OBSERVATION POINT (BARE BEACH)
STRUCTURE 236
CHARLOTTE COUNTY
LEE COUNTY
GLADES COUNTY
HENDRY COUNTY
MARTIN COUNTY
ST. LUCIE COUNTY
PALM BEACH COUNTY
OKEECHOBEE COUNTY
COLLIER COUNTY
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION MAP
▭ STRUCTURES
2 1 0 2 4 6
SCALE IN MILES
NORTH

PART I

PROJECT DESCRIPTION



HURRICANE GATE NO. 4, STRUCTURE 351

CHAPTER 1

PIXIE VI
BAY QUEEN

OVERVIEW OF PROJECT PLANNING

OVERVIEW of PROJECT PLANNING

1-1 PROJECT AUTHORIZATION

1-1.1 The Central and Southern Florida (C&SF) Project is basically one for flood control and water conservation. It provides for three conservation areas for water impoundment in the Everglades area, with control structures to effect transfer of water as necessary. The Project provides water control and protection from the recurrence of devastating flood waters for the highly developed urban area along the lower east coast of Florida and for the highly productive agricultural areas around Lake Okeechobee (including the towns around the Lake), in the Upper St. Johns and Kissimmee River Basins, and in south Dade County. Another important project function is the conservation of waters for beneficial uses during the dry seasons.

The CS&F Project's first phase was authorized by the Flood Control Act of June 30, 1948. It consisted of most of the works necessary to afford flood protection to the productive agricultural development south of Lake Okeechobee and to the highly developed urban area along the lower east coast. The second phase, consisting of all remaining works of the original Comprehensive Plan, was authorized by the Flood Control Act of September 3, 1954, and later Flood Control Acts.

The Flood Control Act of 1968 expanded the Project to provide for increased storage, conservation, and improved distribution of water throughout much of the project area. It also included recreation as a full project purpose. The 1968 modification would also facilitate increased delivery of water to Everglades National Park.

1-2 PROJECT LOCATION

1-2.1 The entire C&SF Project study area covers about 16,000 square miles in the southern half of peninsular Florida. As shown in Figure 1A, it includes the Kissimmee River Basin north of Lake Okeechobee, Lake Okeechobee, and the Everglades generally south of Lake Okeechobee, including Everglades National Park. The '68 Authorization, which recognized recreation as a project purpose, deals with the southern portion of the Project as shown in Figure 1B. A portion of this vast area was selected as the focus of this Master Plan based on the need to limit the size and complexity of the study. This Phase I area consists of the Okeechobee Waterway, between the St. Lucie and W. P. Franklin Locks, and Lake Okeechobee and all adjacent project lands. A Phase II Master Plan, to be prepared at a later date, will discuss the remaining portions of the CS&F Project south of Lake Okeechobee.

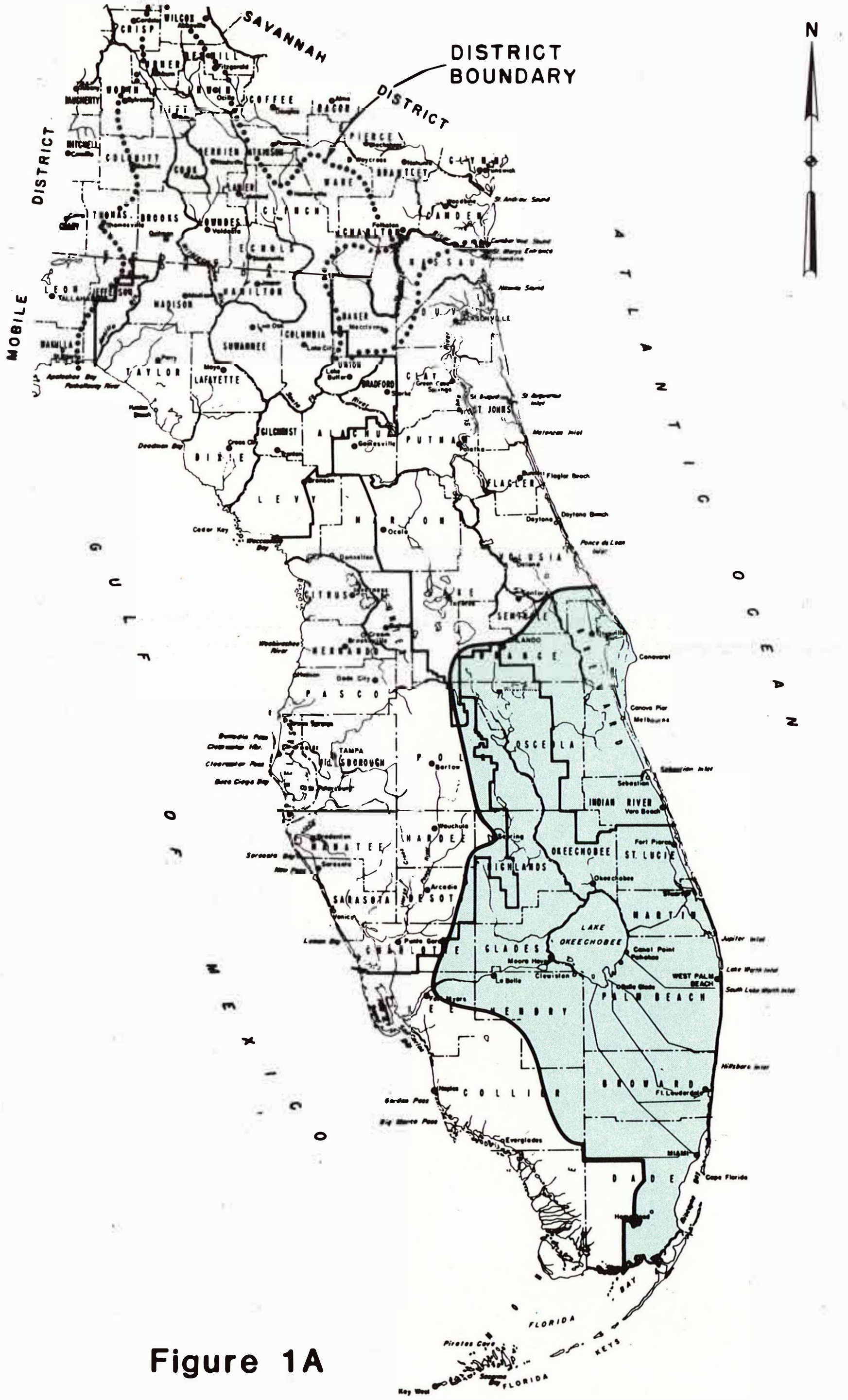
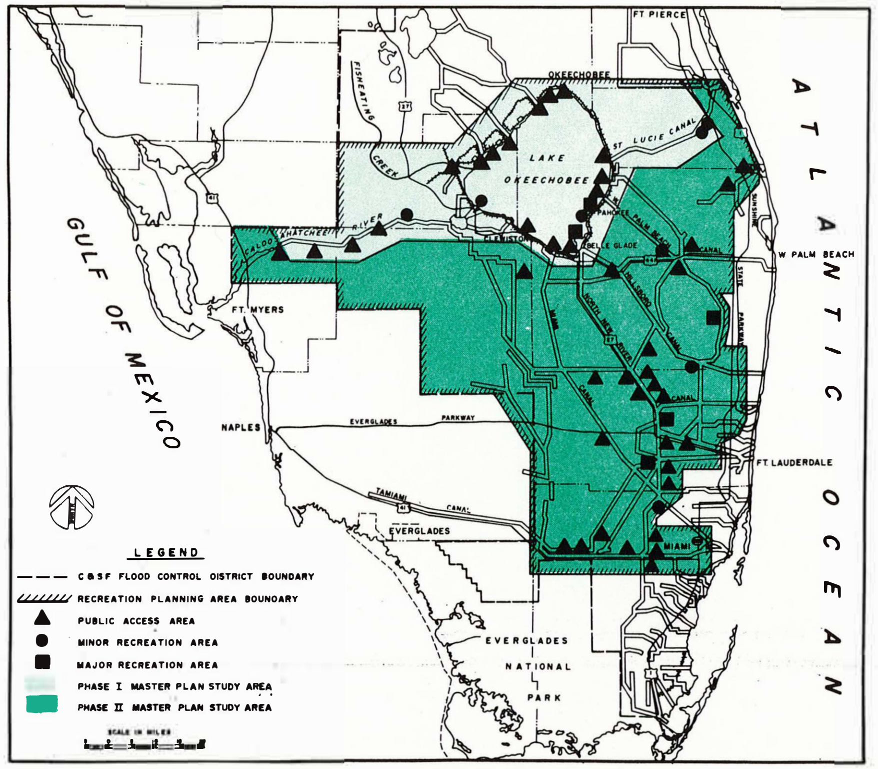

SAVANNAH DISTRICT
DISTRICT BOUNDARY
N
MOBILE DISTRICT
ATLANTIC OCEAN
GULF OF MEXICO
LAKE OKEECHOBEE
WEST PALM BEACH

Figure 1A

1-3 PREVIOUSLY ISSUED REPORTS ASSOCIATED WITH PUBLIC USE DEVELOPMENT

1-3.1 Various Corps' studies and reports preceding this Master Plan have recognized public use opportunities. These reports, as listed below, have laid the framework for existing facility development.


FT PIERCE
OKEECHOBEE
LAKE OKEECHOBEE
ST LUCIE CANAL
CALOOSAHATCHEE RIVER
BELLE GLADE
W PALM BEACH
FT MYERS
NAPLES
EVERGLADES PARKWAY
TAMIAMI CANAL
EVERGLADES
FT LAUDERDALE
MIAMI
EVERGLADES NATIONAL PARK
GULF OF MEXICO
ATLANTIC OCEAN
LEGEND
C&SF FLOOD CONTROL DISTRICT BOUNDARY
RECREATION PLANNING AREA BOUNDARY
▲ PUBLIC ACCESS AREA
● MINOR RECREATION AREA
■ MAJOR RECREATION AREA
PHASE I MASTER PLAN STUDY AREA
PHASE II MASTER PLAN STUDY AREA
SCALE IN MILES

CENTRAL & SOUTHERN FLORIDA
1968 AUTHORIZATION

Figure 1B

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 8, Design Memorandum: General Development Plan, Recreation, Public Use and Operation, dated 5/6/1958.

Central and Southern Florida Project for Flood Control and Other Purposes, Part II, Kissimmee River Basin and Related Area, Supplement 5. Section 1, General Design Memorandum; Modification of Kissimmee River (C-38) For Fish and Wildlife, dated 10/31/1958.

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 9, Detail Design Memorandum: Detail Development Plan, Recreation, Facilities on Canals 43 and 44, dated 5/14/1959.

Central and Southern Florida Project for Flood Control and Other Purposes, Part IV, Lake Okeechobee and Outlets, Supplement 19, Preliminary Master Plan, Caloosahatchee River, dated 5/31/1963.

Water Resources for Central and Southern Florida, Letter Report, Appendix H, Preliminary Recreation Plan, dated 6/3/1968.

1-4 LAWS AND POLICY APPLICABLE TO RESOURCE MANAGEMENT AND DEVELOPMENT

1-4.1 The following Federal statutes, other applicable laws, executive orders, interagency agreements and Corps regulations affecting resource development and mangement have been considered during this study.

1-4.2 Public Law 78-534 - The Flood Control Act of 1944, as amended, authorizes the Chief of Engineers to construct, operate, and maintain public park and recreational facilities at water resource projects. It also requires that the water areas of all such projects be open to public use for boating, fishing, and other recreation and that ready access to and exits from such areas be maintained for general public use when in the public interest.

1-4.3 Public Law 85-624 - The Fish and Wildlife Coordination Act of 1958, as amended, requires that wildlife conservation receive equal consideration with other features of water-resource development programs; that proposals for work affecting any body of water be coordinated with the Fish and Wildlife Service (FWS) and the State Wildlife Agency; that recommendations by the FWS and the State agency be given full consideration; and that justifiable means and measures for wildlife purposes, including mitigation measures, be adopted. The Act requires that adequate provisions be given for the use of project lands and waters for the conservation, maintenance, and management of wildlife resources, including their development and improvement. It provides that the use of project lands for wildlife management be in accordance with general plans approved jointly by The Department of the Army, Department of Interior, and the State Wildlife Agency.

1-4.4 Public Law 88-578 - The Land and Water Conservation Fund Act of 1965, as amended, authorizes Federal assistance to the states for planning, acquisition and development of land and water areas for public recreation. Regulations are established for entrance and user fees.

1-4.5 Public Law 89-72 - The Federal Water Project Recreation Act of 1965, requires that full consideration be given to opportunities for recreation and fish and wildlife enhancement; that recreation planning be based on coordination of use with existing and planned Federal, State, and local recreation; and that non-Federal administration of recreation and enhancement areas be encouraged. It further states that, without a cost-sharing sponsor, facilities may not be provided for recreation and fish and wildlife enhancement except those justified to serve other project purposes or as needed for public health and safety.

1-4.6 Public Law 90-483 - The Flood Control Act of 1968, authorizes the water resources project for Central and Southern Florida.

1-4.7 Public Law 91-190 - The National Environmental Policy Act of 1969, as amended, declares a national environmental policy and requires that all Federal agencies shall, to the fullest extent possible, use a systematic, interdisciplinary approach which integrates natural and social sciences and environmental design arts in planning and decision making. The agencies shall study, develop and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. Ecological information shall be utilized in the planning and development of projects. An environmental impact statement shall be included in every recommendation or report on proposals for major Federal actions significantly affecting the quality of the human environment.

1-4.8 Public Law 92-512 - The State and Local Fiscal Assistance Act of 1972, as amended by P.L. 94-488 of 1976, provides that Revenue Sharing Funds can be made available to States and local communities. The amendment (P.L. 94-488) provides that these funds can be used as matching funds by the locals on Corps cost sharing projects.

1-4.9 Public Law 96-95 - The Archeological Resources Protection Act of 1979, protects archeological resources and sites which are on public lands and Indian land, and fosters increased cooperation and exchange of information between government authorities, the professional community, and private individuals. It establishes requirements for issuance of permits by Federal land managers to excavate or remove any archeological resource located on public or Indian lands.

1-4.10 Public Law 89-669 - Endangered Species Act of 1973, states the policy of Congress that the Secretaries of Interior, Agriculture and Defense shall seek to protect species of native fish and wildlife, including migratory birds, that are threatened with extinction and, insofar as it is practicable and consistent with the primary purposes of these agencies, shall preserve the habitats of such threatened species on lands under their jurisdiction.

COOPERATIVE AGREEMENTS

1-4.11 Resolution #880 dated October 17, 1969 of the Central and Southern Flood Control District (now the South Florida Water Management District, SFWMD) acknowledges their responsibility for requirements of local cooperation as set forth in House Document No. 369, 90th Congress, 2nd Session in connection with the improvement by the Federal government of water resources for Central and Southern Florida, authorized by Public Law 90-483, approved 13 August 1968.

1-4.12 Memorandum of Agreement dated April 18, 1973 between the Corps of Engineers and the U.S. Coast Guard clarifies areas of jurisdiction and responsibilities under Federal statutes to regulate certain activities in navigable waters of the United States. The agreement covers alteration of bridges; construction, operation, and maintenance of bridges and causeways; closure of waterways and restriction of passage under bridges; and design of flood flows. The agreement also requires mutual coordination and consultation on projects and activities in or affecting navigable waters.

1-4.13 Resolution #74-46, dated August 16, 1974 of the Central and Southern Florida Flood Control District (now SFWMD) indicates their intent to participate with the Corps of Engineers in recreation development of various public use areas on the Okeechobee Waterway and around Lake Okeechobee.

CORPS OF ENGINEERS REGULATIONS

1-4.14 ER 1105-2-20, 15 May 1985, Project Purpose Planning Guidance (Chapter 6-Recreation), provides requirements for inclusion of recreation as a project purpose and guidance on the types of projects and facilities allowed with appropriate Federal and non-Federal participation.

1-4.15 ER 1105-2-50, 29 January 1982, Environmental Resources, provides requirements for environmental resources planning, consistent with national policies both to create and maintain conditions under which the human and natural environments can exist in productive harmony, and to preserve important historic and archaeological resources. see ADDENDUM

1-4.16 ER 1105-2-167, 12 April 1978, Planning Resource Use: Establishment of Objectives, provides policy and guidance on establishing resource use objectives.

1-4.17 ER 1120-2-400, 14 August 1970, Investigation, Planning and Development of Water Resources: Federal

Participation in Recreational Development, provides policies, guidelines and procedures for insuring that protection and enhancement of recreation resources are given equal treatment with other objectives in the planning and development of water resources projects under the jurisdiction of the Corps of Engineers.

* 1-4.18 ER 1130-2-400, 1 October 1983, Management of Natural Resources and Outdoor Recreation at Civil Works Water Resource Projects, provides policy and procedural guidance for the administration and management of Civil Works Water Resource Projects to (a.) manage natural resources on Corps of Engineers administered land and water to insure their continued availability, (b.) provide outdoor recreation opportunities on a sustained basis and (c.) provide a safe and healthful environment for project visitors.

1-4.19 ER 1130-2-406, 13 December 1974, Lakeshore Management at Civil Works Projects, provides policy and guidance on the protection of desirable environmental characteristics of Civil Works lake projects and restoration of shorelines where degradation has occurred through private exclusive use.

1-4.20 ER 1165-2-400, 9 August 1985, Water Resources Policies and Authorities, Recreation Planning Development and Management Policies, defines the objectives, philosophies and basic policies for the planning, development and management of outdoor recreation and enhancement of fish and wildlife resources.

1-4.21 SADVR 1110-2-10, 17 April 1979, Engineering and Design: Recreation Resources Planning, Design and Management, provides consolidation of recreation resources planning, design and management guidance.

Delete paragraphs 1-4.3 and 1-4.4 since they do not apply to this project. *

PROJECT MANAGEMENT

2-1 OVERVIEW OF THE MASTER PLAN STUDY AREA

2-1.1 The Phase I Master Plan Study Area of the Central and Southern Florida (C&SF) Project is comprised of the freshwater portions of the Okeechobee Waterway between the St. Lucie and W. P. Franklin Locks, Lake Okeechobee and all adjacent project lands. It is an integrated system for flood control, water supply, recreation, and navigation.

2-1.2 The Okeechobee Waterway, operated and maintained by the Corps of Engineers, is a contiguous 155-mile navigation system across the Florida peninsula as shown in Figure 2A. It is comprised of three distinct segments: the St. Lucie Canal, Lake Okeechobee, and the Caloosahatchee River. The easterly limit of the system lies on the Intracoastal Waterway near Stuart, Florida. From that point, it passes westerly through the St. Lucie River, the South Fork of the St. Lucie River, and into the St. Lucie Canal system. The system enters the St. Lucie Lock at statute mile 15.1, passes Indiantown at mile 28.1, and reaches Port Mayaca Lock at mile 39. From Port Mayaca Lock, the Waterway takes two distinct routes across Lake Okeechobee to the town of Clewiston, mile 65. Route 1 travels across open water while Route 2, known as the Rim Canal, follows the southern shore, passing the towns of Canal Point, Pahokee, Belle Glade, and Lake Harbor. From Clewiston the Waterway continues 13 miles along the shoreline, reaching the Moore Haven Lock at mile 78. The Waterway continues on a three-mile run of canal from Moore Haven to Lake Hicpochee, then along the Caloosahatchee River to Ortona Lock, at mile 93.5. Proceeding westerly past the towns of LaBelle, Denaud, Alva, through the W. P. Franklin Lock at mile 121.4, and past Olga, Tice and the City of Fort Myers, it reaches the Caloosahatchee River estuary and terminates approximately one mile offshore of Estero Island.

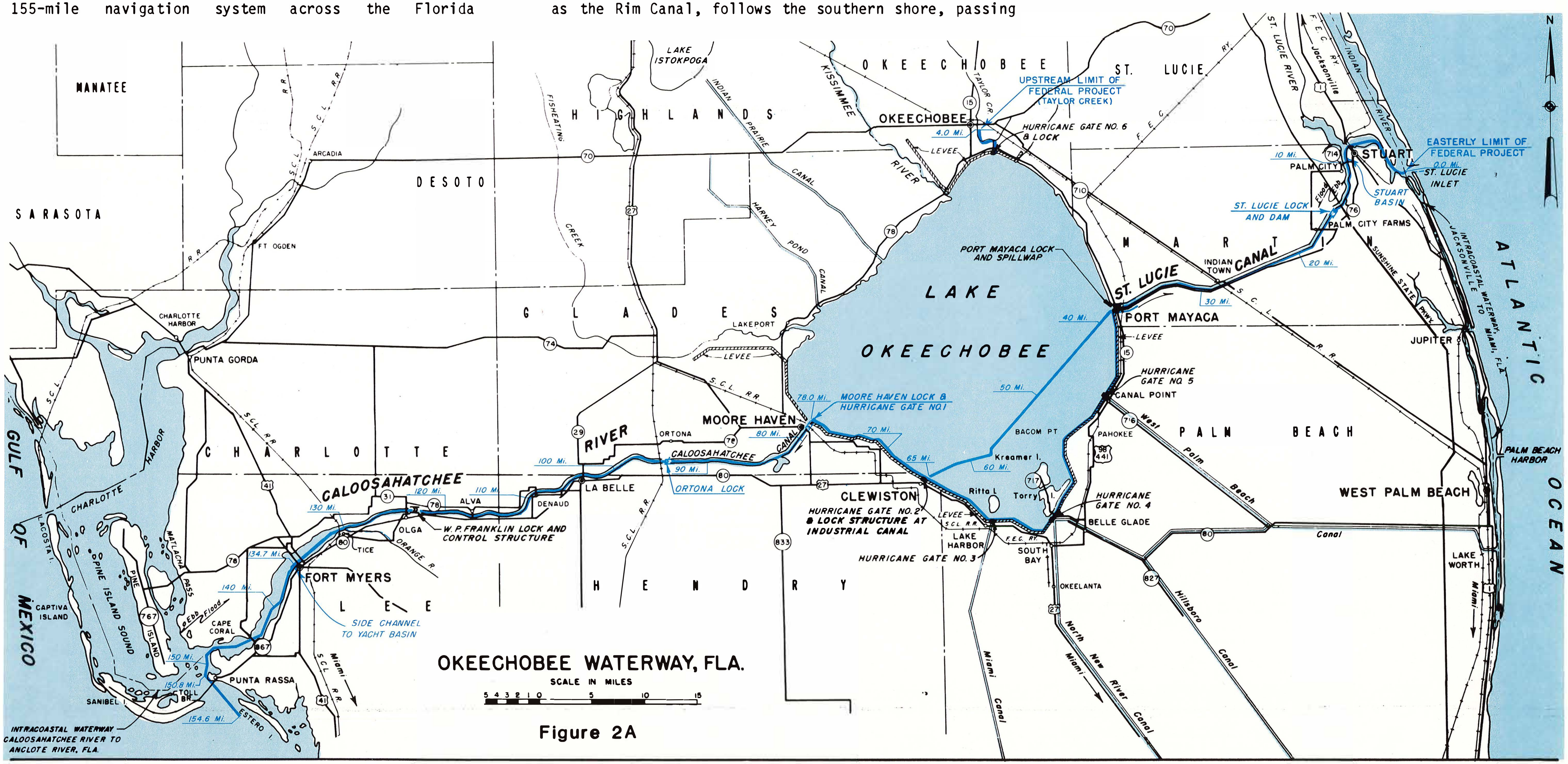

OKEECHOBEE WATERWAY, FLA.
SCALE IN MILES
5 4 3 2 1 0 5 10 15
N
MANATEE
SARASOTA
DESOTO
HIGHLANDS
OKEECHOBEE
ST. LUCIE
GLADES
CHARLOTTE
MARTIN
PALM BEACH
HENDRY
LEE
LAKE ISTOKPOGA
ARCADIA
FT OGDEN
CHARLOTTE HARBOR
PUNTA GORDA
LAKEPORT
MOORE HAVEN
ORTONA
LA BELLE
DENAUD
ALVA
OLGA
TICE
FORT MYERS
CAPE CORAL
PUNTA RASSA
SANIBEL I.
CAPTIVA ISLAND
PINE ISLAND
PINE ISLAND SOUND
MATLACHA PASS
LACOSTA I.
ESTERO
OKEECHOBEE
PORT MAYACA
CANAL POINT
PAHOKEE
BACOM PT
Kreamer I.
Ritta I.
Torry I.
CLEWISTON
LAKE HARBOR
SOUTH BAY
BELLE GLADE
OKEELANTA
INDIAN TOWN
PALM CITY
PALM CITY FARMS
STUART
JUPITER
WEST PALM BEACH
LAKE WORTH
LAKE OKEECHOBEE
CALOOSAHATCHEE RIVER
ST. LUCIE CANAL
GULF OF MEXICO
ATLANTIC OCEAN
CHARLOTTE HARBOR
KISSIMMEE
INDIAN PRAIRIE CANAL
HARNEY POND CANAL
FISHEATING CREEK
TAYLOR CR.
ORANGE R.
ST. LUCIE RIVER
INDIAN RIVER
ST. LUCIE INLET
STUART BASIN
PALM BEACH HARBOR
UPSTREAM LIMIT OF FEDERAL PROJECT (TAYLOR CREEK)
HURRICANE GATE NO. 6 & LOCK
EASTERLY LIMIT OF FEDERAL PROJECT
0.0 Mi.
10 Mi.
20 Mi.
30 Mi.
40 Mi.
50 Mi.
60 Mi.
65 Mi.
70 Mi.
78.0 Mi.
80 Mi.
90 Mi.
100 Mi.
110 Mi.
120 Mi.
130 Mi.
134.7 Mi.
140 Mi.
150 Mi.
150.8 Mi.
154.6 Mi.
4.0 Mi.
ST. LUCIE LOCK AND DAM
PORT MAYACA LOCK AND SPILLWAP
HURRICANE GATE NO. 5
HURRICANE GATE NO. 4
HURRICANE GATE NO. 3
HURRICANE GATE NO. 2 & LOCK STRUCTURE AT INDUSTRIAL CANAL
MOORE HAVEN LOCK & HURRICANE GATE NO. 1
ORTONA LOCK
W. P. FRANKLIN LOCK AND CONTROL STRUCTURE
SIDE CHANNEL TO YACHT BASIN
LEVEE
TOLL BR.
Ebb
Flood
INTRACOASTAL WATERWAY CALOOSAHATCHEE RIVER TO ANCLOTE RIVER, FLA.
INTRACOASTAL WATERWAY, JACKSONVILLE TO MIAMI, FLA.
SUNSHINE STATE PKWY
S.C.L. R.R.
F.E.C. RY.
West Palm Beach Canal
Hillsboro Canal
North New River Canal
Miami Canal
Miami
70
15
78
710
714
76
27
29
74
80
31
41
767
867
833
98
441
717
827

Figure 2A

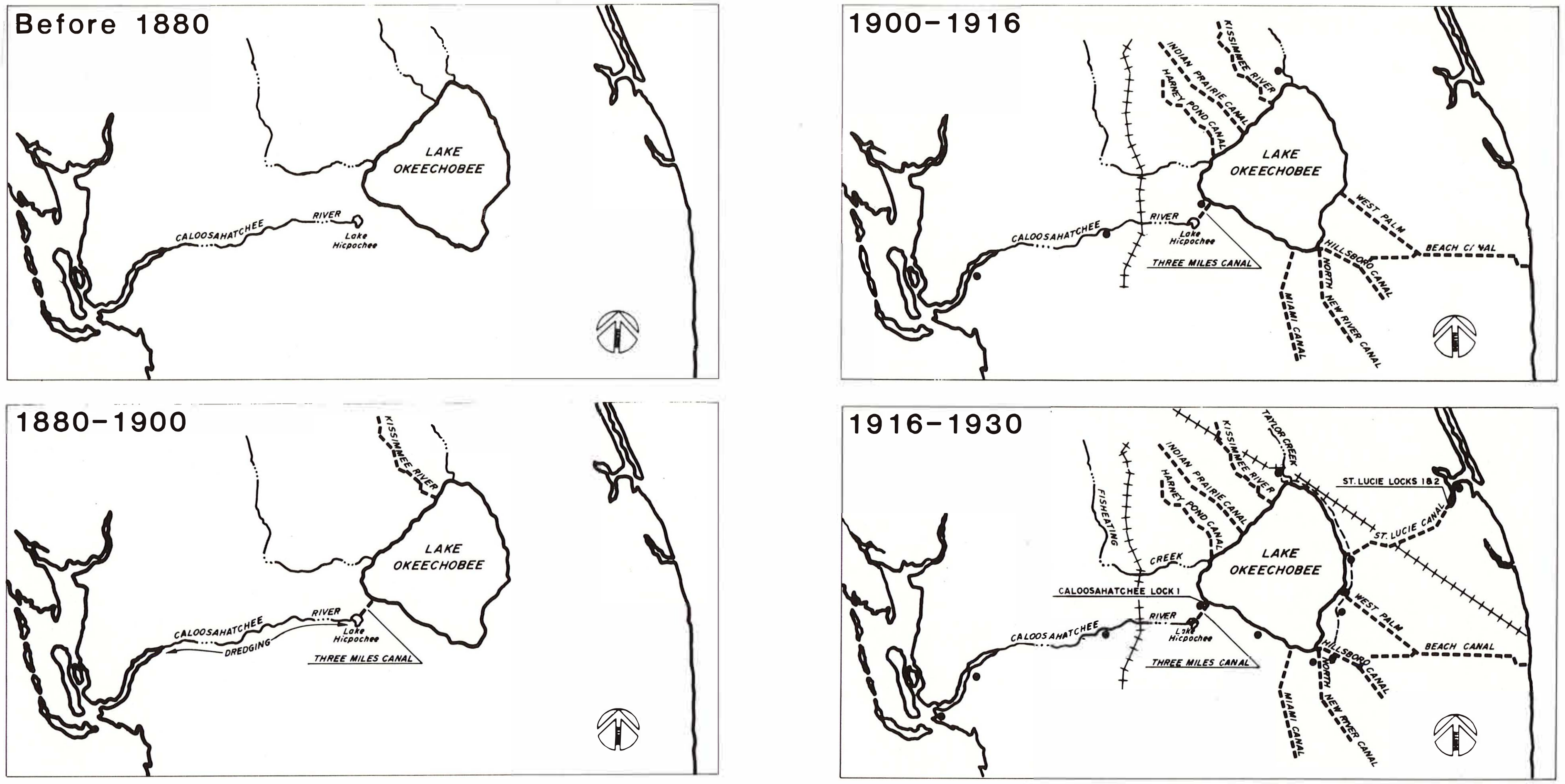
2-1.3 Although only a small portion of Lake Okeechobee is integral to the Waterway, the entire Lake is jointly managed for flood control and water supply purposes by the Corps of Engineers and the South Florida Water Management District. The Lake is included in this Phase I study because of its relation to the Waterway and as a major component of the entire C&SF Project. The Lake is a large, shallow, freshwater lake approximately 35 miles across from north to south and 30 miles across from east to west.

2-2 HISTORICAL PERSPECTIVE

2-2.1 The Okeechobee Waterway and Lake Okeechobee area have seen a full century of development for drainage, flood control, water supply, and navigation. Construction has been accomplished by both private individuals and public agencies. Early development phases are illustrated by the series of maps in Figure 2B.

2-2.2 The impetus behind the Waterway's initial development was the drainage and reclamation of swamplands for the creation of agricultural lands. The development of the Okeechobee Waterway began in the 1880's with the work of Hamilton Disston and his Atlantic and Gulf Coast Canal and Land Company. Disston had been contracted by the State of Florida to drain vast land areas, thereby opening the land to settlement. By 1883 Disston's Company had opened 360 contiguous miles of navigable waterway through the State's interior from the inland town of Kissimmee to Fort Myers on the Gulf Coast. This navigation system connected the Kissimmee River, Lake Okeechobee, and the Caloosahatchee River. A major link in the system was the dredging of a canal through Lake Hicpochee, called Three Mile Canal, connecting the Caloosahatchee to Lake Okeechobee.

2-2.3 In 1905, the Everglades Drainage District was created by the State legislature to continue the drainage of the Everglades which Disston had begun. By 1915, the District began dredging the St. Lucie Canal to control lake levels and drainage in Lake Okeechobee by connecting the Lake to the Atlantic Ocean. With the construction of the St. Lucie Canal, a limited waterway between the east and west coasts of Florida was created. In order to control lake levels, two locks and dams were built on the Canal by the Everglades Drainage District. Extensive drainage canals in areas surrounding the Lake were also excavated during the 1900 to 1916 period.


Before 1880
LAKE OKEECHOBEE
CALOOSAHATCHEE
RIVER
Lake Hicpochee
1880-1900
KISSIMMEE RIVER
LAKE OKEECHOBEE
CALOOSAHATCHEE
DREDGING
RIVER
Lake Hicpochee
THREE MILES CANAL
1900-1916
KISSIMMEE RIVER
INDIAN PRAIRIE CANAL
HARNEY POND CANAL
LAKE OKEECHOBEE
CALOOSAHATCHEE
RIVER
Lake Hicpochee
THREE MILES CANAL
WEST PALM BEACH CANAL
HILLSBORO CANAL
NORTH NEW RIVER CANAL
MIAMI CANAL
1916-1930
TAYLOR CREEK
KISSIMMEE RIVER
INDIAN PRAIRIE CANAL
HARNEY POND CANAL
FISHEATING CREEK
ST. LUCIE LOCKS 1&2
ST. LUCIE CANAL
LAKE OKEECHOBEE
CALOOSAHATCHEE LOCK 1
CALOOSAHATCHEE
RIVER
Lake Hicpochee
THREE MILES CANAL
WEST PALM BEACH CANAL
HILLSBORO CANAL
NORTH NEW RIVER CANAL
MIAMI CANAL

DEVELOPMENT PHASES OF THE STUDY AREA
Figure 2B

2-2.4 By 1926 many miles of low dikes around Lake Okeechobee had been constructed to help control lake levels for drainage. These were fairly effective under normal conditions, however, two hurricanes in 1926 and 1928 devastated communities around the Lake and 2,500 lives were lost. These disasters created an urgency to provide flood control on the Lake and solve the problems created by the extensive drainage and settlement of large areas susceptible to flooding. To this end, the Okeechobee Flood Control District was created by the Florida legislature to find solutions.

2-2.5 Through efforts by the Okeechobee Flood Control District, the Federal Government adopted the project in 1930 as a navigation project with due consideration to be given to flood control. A series of improvements undertaken by both the Federal and State Governments over 50 years have resulted in the existing project.

2-3 EXISTING CORPS PROJECT INFRASTRUCTURE

2-3.1 Okeechobee Waterway. The Okeechobee Waterway, as a Federal navigation project, was first authorized under the Permanent Appropriation Repeal Act of June 26, 1934. The navigation channel and five locks and dams; two on the St. Lucie Canal and three on the Caloosahatchee River, are maintained by the Corps of Engineers. Critical navigable characteristics of the locks are shown in the tables under Project Data at the beginning of this document. A water surface profile of the Waterway at the minimum Lake Okeechobee operating level for navigation (el. 12.56 ft.*) is shown in Figure 2C.

2-3.2 Auxiliary channels and structures on the

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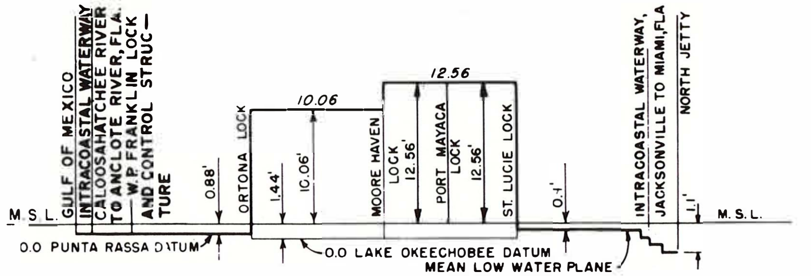
* All elevations given throughout this report are based on the National Geodetic Vertical Datum, N.G.V.D.


GULF OF MEXICO
INTRACOASTAL WATERWAY
CALOOSAHATCHEE RIVER TO ANCLOTE RIVER, FLA.
W.P. FRANKLIN LOCK AND CONTROL STRUCTURE
0.88'
ORTONA LOCK
1.44'
10.06'
10.06
MOORE HAVEN LOCK 12.56'
12.56
PORT MAYACA LOCK 12.56'
ST. LUCIE LOCK
0.1'
INTRACOASTAL WATERWAY, JACKSONVILLE TO MIAMI, FLA
NORTH JETTY
1.1'
M.S.L.
M.S.L.
0.0 PUNTA RASSA DATUM
0.0 LAKE OKEECHOBEE DATUM
MEAN LOW WATER PLANE

PROJECT DEPTHS ARE BASED ON THE ABOVE
WATER SURFACE PROFILE OF OKEECHOBEE WATERWAY

Figure 2C

Okeechobee Waterway include a secondary channel (the Rim Canal) 6 feet deep and 80 feet wide following the south shore of Lake Okeechobee from the Port Mayaca Lock (Mile 39.0) to the town of Clewiston (Mile 65.0); a 6 feet deep by 60 feet wide channel in Taylor Creek from the town of Okeechobee to Lake Okeechobee, 4.8 miles; and a side channel 8 feet deep by 100 feet wide to the municipal yacht basin at Ft. Myers.

2-3.3 Lake Okeechobee. In addition to serving as the central portion of the Okeechobee Waterway, Lake Okeechobee is operated as a multi-purpose reservoir with the South Florida Water Management District (SFWMD), the local sponsor. The C&SF Project was first authorized in the Flood Control Act of 1948; although, construction of flood control measures on the Lake actually began in the 1930's in conjunction with the navigation project. The most recent and comprehensive authority, under which the project is currently operated, is found in the Flood Control Act of 1968. Prior to this '68 Authorization, primary emphasis was on eliminating flood water and providing flood protection for agricultural and urban areas of the lower east coast of Florida. One of the most significant modifications to the Project came in 1968 with the addition of a Water Resources Plan to improve the supply, distribution, and conservation of water resources.

2-3.4 The existing project structures, the 140 mile system of levees that nearly surround the Lake, important canals, control structures, and pumping stations have a long history of construction. Pertinent data about these C&SF project structures on Lake Okeechobee are listed in the tables under Project Data at the beginning of this document. Their locations are shown in Figure 2D.

2-3.5 The current regulation schedule for Lake Okeechobee as a multi-purpose reservoir was adopted in May 1978 and establishes a normal range of regulation between elevations 15.5 to 17.5 ft. Water stages can be expected to exceed both these minimum and maximum

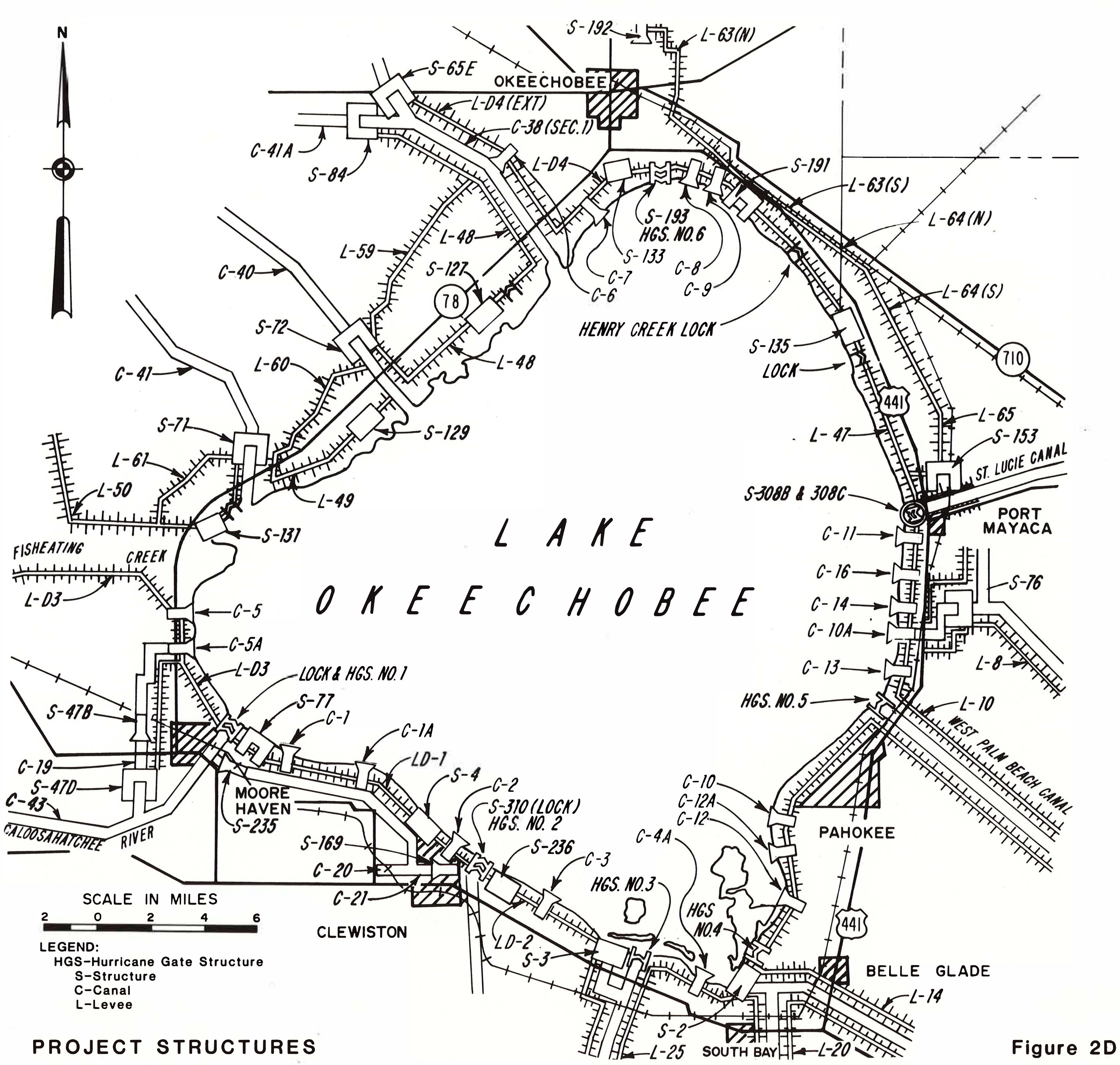
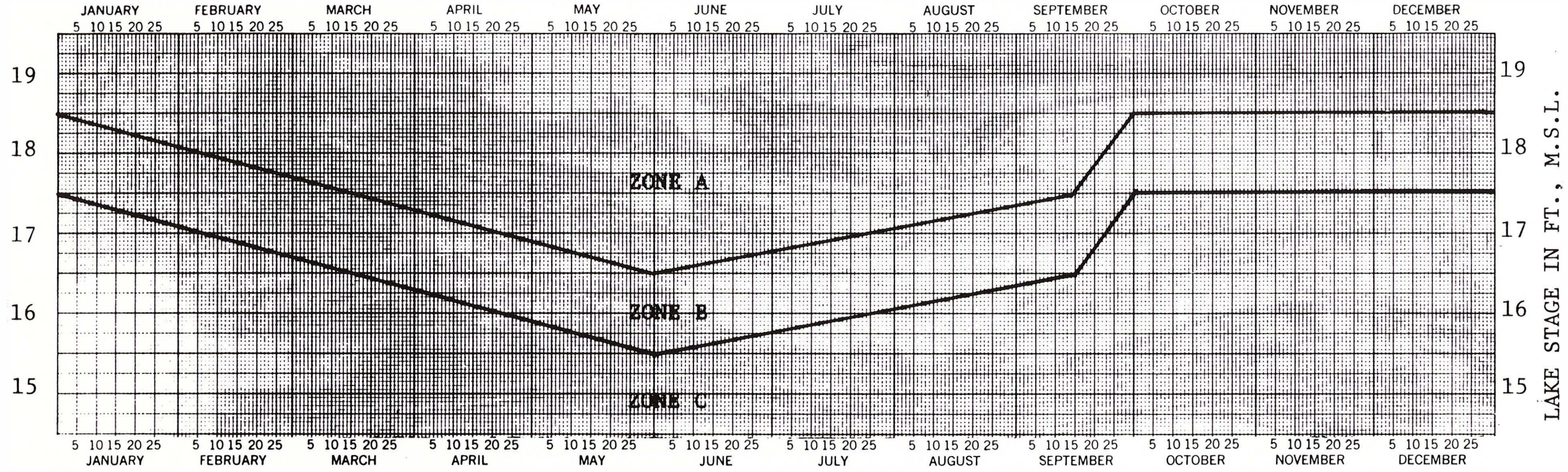

N
S-192
L-63(N)
S-65E
OKEECHOBEE
L-D4(EXT)
C-38(SEC.1)
C-41A
S-84
L-D4
S-191
L-63(S)
L-64(N)
L-48
L-59
S-193
HGS. NO. 6
S-133
C-7
C-8
C-6
C-9
C-40
S-127
78
L-64(S)
HENRY CREEK LOCK
S-72
L-60
L-48
S-135
LOCK
710
C-41
S-129
441
L-65
S-153
L-47
S-71
ST. LUCIE CANAL
L-61
L-50
L-49
S-308B & 308C
PORT MAYACA
S-131
LAKE
C-11
FISHEATING CREEK
C-16
S-76
L-D3
OKEECHOBEE
C-14
C-5
C-10A
C-5A
L-D3
LOCK & HGS. NO. 1
C-13
L-8
S-77
C-1
S-47B
HGS. NO. 5
L-10
C-1A
WEST PALM BEACH CANAL
LD-1
C-19
S-4
C-2
S-47D
C-10
C-43
MOORE HAVEN
S-310 (LOCK)
C-12A
S-235
HGS. NO. 2
C-12
CALOOSAHATCHEE RIVER
C-4A
PAHOKEE
S-169
S-236
C-3
C-20
HGS. NO. 3
C-21
HGS NO. 4
SCALE IN MILES
2 0 2 4 6
CLEWISTON
441
LD-2
S-3
LEGEND:
HGS-Hurricane Gate Structure
S-Structure
C-Canal
L-Levee
BELLE GLADE
L-14
S-2
L-25
SOUTH BAY
L-20
PROJECT STRUCTURES

Figure 2D

limits in the Lake's operation to reduce flood damages and furnish water for agriculture and urban use.

2-3.6 The Interim Regulation Schedule for Lake Okeechobee is shown in Figure 2E. The schedule defines 3 zones to gage outlet releases at various lake levels. Zone C, the bottom zone with an upper limit between elevations 15.5 and 17.5 ft., represents the conservation pool and reflects the maximum desirable water levels for Lake Okeechobee. When the lake stage is in Zone C, water is distributed for water supply. Zone B represents a one foot rise above levels in Zone C and moderate regulatory releases. Zone A defines the point at which up to maximum regulatory releases are initiated and maintained until the lake level recedes to Zone B.

2-3.7 Since 1978, water levels have entered Zone B during every year except the extreme drought year of 1981. Since the USGS began maintaining stage records for Lake Okeechobee, the highest stage was 18.77 ft. recorded on 2 November 1947 and the lowest stage was 9.79 ft. recorded on 30 July 1981. The second highest recorded stage for the Lake occurred on 1 March 1983 and was about 18.20 ft. With the current schedule, the 30 day average lake stage expected to result from a 100 yr. storm is 21.2 ft. The 30 day average lake stage expected to result from a standard project flood is 23.5 ft. with a peak stage of 24.9 ft. See ADDENDUM



RELEASE THROUGH OUTLETS AS INDICATED			
ZONE	AGRICULTURAL CANALS	CALOOSAHATCHEE RIVER	ST. LUCIE CANAL
A	PUMP MAXIMUM PRACTICABLE TO CONSERVATION AREAS FOR REGULATION AFTER REMOVAL OF LOCAL RUNOFF.	UP TO MAXIMUM CAPACITY (9,300 C.F.S. AT S-77) WITHOUT LOCAL FLOODING	UP TO MAXIMUM DISCHARGE AT S-308C
B*		UP TO 4500 C.F.S. AT S-77	UP TO 2,500 C.F.S. AT S-80**
C	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE	NO REGULATORY DISCHARGE
	FIRST PRIORITY	SECOND PRIORITY	THIRD PRIORITY

*RELEASES THROUGH VARIOUS OUTLETS MAY BE MODIFIED TO MINIMIZE DAMAGES OR OBTAIN ADDITIONAL BENEFITS

**EXCEPT WHEN EXCEEDED BY LOCAL INFLOW

Central and Southern Florida
INTERIM REGULATION SCHEDULE
LAKE OKEECHOBEE
Department of the Army, Jacksonville District
Corps of Engineers, Jacksonville, Florida
DATED 10 May 1978

Figure 2E

2-3.8 In the Project's '68 Authorization, raising the Lake Okeechobee regulation schedule to allow storage of additional water to satisfy the increasing demands of south Florida was sanctioned. This raise would include a maximum conservation pool that fluctuates between elevations 19.5 and 20.5 ft. with an upper limit that fluctuates between elevations 20.5 and 21.5 ft. The authorized change in regulation schedule has not been implemented; however, this and other water supply alternatives are being addressed in the C&SF Water Supply Study. See ADDENDUM

2-3.9 The Caloosahatchee River and the St. Lucie Canal serve as major outlets from the Lake for flood control purposes and are used to maintain lake levels. The Caloosahatchee River channel has been significantly deepened and widened under the C&SF Project to improve discharge capacity from Lake Okeechobee and surrounding drainage areas. Under the C&SF Project, flood control channel depths enlarging the navigation channel have been constructed from Moore Haven to Tice. River cross-sections beyond that point are generally adequate to pass flood flows.

2-3.10 Corps Recreation Areas. The Corps of Engineers has fee ownership in six parcels of land along the Waterway. Of these, the Corps maintains three areas for recreation, while portions of two are leased to concessionaires and one will be developed pending approval of a cost-sharing agreement. An inventory of existing facilities is shown in Table 2A.

2-3.11 St. Lucie Lock and Dam. This site in Martin County is the first lock on the St. Lucie Canal. It is located southwest of Stuart and accessible by SR 76. There are recreation facilities on both the north and south banks of the Canal. The south side contains the lockmaster's office and quarters and most of the recreation facilities. These facilities consist of a nine site campground with park attendant, washhouse, sanitary dump station, one-lane boat ramp, playground, a picnic shelter and 4 picnic tables. The north side is accessible by foot across the lock from the south. Facilities consist of 3 group campsites, a fishing pier, amphitheater, picnic shelter, 8 tables, grills and a one-mile nature trail. The steep banks of the shoreline on both sides restrict access to the water. A historical point of interest is an old lock now filled with dirt located between the spillway and the existing lock.

CORPS FACILITIES

CORPS FEE LAND						
CLEWISTON AREA OFFICE (12 AC)	W.P. FRANKLIN (57 FEE AC) (6 EASEMENT AC)	ORTONA (66 FEE AC)	MOORE HAVEN *5 (150 FEE AC) (39 EASEMENT AC)	PORT MAYACA (41 FEE AC) (214 EASEMENT AC)	ST. LUCIE PARK (155 FEE ACRES)	
1 / 1	2 / 3	1 / 1	4^{c} / 6^{c}	3 / 3	1 / 1	BOAT RAMPS / LANES
—	25 *7 / 3	25 / 2	17^{c} / 0	—	20 / 2	PICNIC TABLES *1 / SHELTERS
—	29 / 2	30 *6 / 2	31^{c} / 0	—	9 / 3	CAMPSITES / GROUP CAMP AREAS
WBT	2 WH	2 WH	WH^{c}	—	WH	SANITARY FACILITIES *2
—	250	—	—	—	—	BEACH (LF) *3
—	—	—	—	—	1	NATURE TRAILS
0 / 6	30 / 96	5 / 15	79^{c} 5c / 19	10 / 10	18 / 80	PARKING: RAMP / CAR *4
—	100	240	50	—	80	FISHING PIER: LF
—	—	—	5^{c}	—	—	BOAT SLIPS

NOTES
*1. SOME ARE SINGLE TABLES WITH SHELTERS
*2. WH - WASHHOUSE; WBT - WATER BORNE TOILET
*3. NO LIFEGUARD
*4. APPROXIMATE
*5. PART OF AREA IS OPERTED BY CONCESSIONAIRE (C)
*6. 10 FREE CAMPSITES
*7. 2 PICNIC & 1 GROUP ASSEMBLY

Table 2A

2-3.12 Port Mayaca Lock and Spillway. This site in Martin County, west of U.S. Highway 441 is accessible by SR 76 and US 441. It is located on both the St. Lucie Canal and Lake Okeechobee. Currently, the area does not have any permanent recreation facilities; however, users launch small boats from three dirt ramps and there is extensive bank fishing. A cost-sharing agreement between the Corps of Engineers and South Florida Water Management District to construct recreation facilities is pending approval.

2-3.13 Clewiston. The Clewiston site in Hendry County is accessible from U.S. Highway 27. The Corps has constructed its Area Office with support facilities on most of the site. Recreation facilities consist of interpretive facilities, a restricted-use one-lane boat ramp, parking, and restroom facilities. The Area Office is responsible for resource management, supervision and inspection of construction and maintenance projects, water quality monitoring, aquatic plant control and operation and maintenance of the C&SF Project area. The Area Office also performs emergency operations and special duties assigned by the District Commander. The Jolly Roger Marina is a concession on 1.3 acres located on the southern end of the parcel.

2-3.14 Moore Haven Lock and Dam. This site in Glades County is accessible from U.S. Highway 27. It is located where Lake Okeechobee and the Caloosahatchee River connect. The east portion of the site is undeveloped except for a fishing pier and a dirt parking area. Glades County is considering leasing part of the site to construct a boat ramp to the Lake with a parking area and paved access roads. The western site is leased to a concessionaire with plans to construct a marina, bait/tackle shop, additional boat ramp and campground. Existing concession facilities consist of a washhouse, sanitary dump station, three boat ramps with four lanes, office, and 31 campsites with hookups. The Corps has a two-lane ramp, courtesy dock, 17 picnic tables and paved parking on a peninsula between the concession site and lock facility. This area is free to the public and maintained by the concessionaire.

2-3.15 Ortona Lock and Dam. This site is located in Glades county and divided into two areas by the Caloosahatchee River. The north side is accessible from SR 78. Facilities consist of a free campground/picnic area with 16 campsites, a washhouse, 2 picnic shelters, 2 porch swings, a one-lane boat ramp with parking, and a fishing pier. The south side is accessible from SR 80 via a stabilized access road. The existing facilities consist of a washhouse, 20 campsites with hookups, two group camp areas, a sanitary dump station, and a fishing pier, with park attendant on duty.

2-3.16 W. P. Franklin Lock and Dam. This site is located in Lee county and divided into two areas by the Caloosahatchee River. It is approximately 11 miles east of Fort Myers and 1 mile east of Olga. The north side is accessible from SR 78. Facilities consist of 29 campsites, a washhouse, play area, sanitary dump station, 2 assembly shelters, a small beach, and a two-lane boat ramp with parking. A park attendant is on duty. The south side is accessible from SR 80. Facilities consist of a washhouse, one-lane boat ramp with parking, 2 picnic shelters, an amphitheater, beach, play equipment, and 25 picnic sites. The south side also contains a resource management office and the lockmaster's office and residence.

2-4 NATURAL RESOURCE MANAGEMENT

2-4.1 The Corps of Engineers' management of the natural resources on the C&SF Project is conducted through several programs. These programs encompass a broad range of activities carried out by the resource staff.

2-4.2 Lakeshore Management. Management of the extensive shoreline is to insure protection of desirable environmental characteristics, visitor safety, and restoration of shoreline where degradation has occurred through private exclusive use. Coordinated management has become increasingly important due to higher visitation and increasing development adjacent to project lands. Currently, Department of the Army permit applications for controlling shoreline use are issued under the Corps' Section 404 and Section 10 programs. Consents-to-easement are also required for activities occurring within Corps easement boundaries. A Lakeshore Management Plan is being prepared to provide a comprehensive, planned approach to these situations and other problems occurring with various uses of the shoreline and project waters. Enforcement of the Lakeshore Management Plan is provided under Title 36 of the Code of Federal Regulation, 3 September 1985.

2-4.3 Recreation Site Management. The resource staff is responsible for recreation site operation and management of five recreation areas on the Project. These areas are: the St. Lucie, Moore Haven, Ortona and W.P. Franklin Recreation Areas and the Clewiston Area Office. These areas are patrolled by the project's rangers. Campgrounds have park attendants on contract to collect user fees and generally oversee the areas. Maintenance of all the areas is performed by a service contract, including but not limited to mowing, facility repairs, cleaning, and trash and dead tree removal. Recreation resource management also involves monitoring lease agreements and contracts with the state and local governments and private concerns providing recreation facilities to insure public safety. Various maintenance contracts are also monitored to insure the proper level of facility repair and maintenance.

2-4.4 Visitor Assistance Program. The Visitor Assistance Program is a major function of the resource staff for controlling resource use and contracting law enforcement at the Project. It involves protection of natural resources, facilities and structures through the use of Title 36 authority. The Park Attendant and Volunteer Programs are administered under this program.

2-4.5 Fish and Wildlife Management. The resource staff maintains a close liason with the Florida Game and Fresh Water Fish Commission. They coordinate maintenance of a steady lake level during the fish spawning season and maintenance of boat trails in the lake. Assistance is provided in the installation of artificial reefs. A major aspect of this program is the management of aquatic plant control programs to the benefit of fish and wildlife populations. A management plan will be developed and coordinated in this regard. See Addendum

2-4.6 Vegetation Management. Management of vegetation on the Project consists of limiting the growth and spread of objectionable non-native plant species and maintenance of grassed areas. Long range plans are being developed by the natural resource management staff for control and removal of melaleuca and Australian pine trees on Lake Okeechobee. Melaleuca spreads rapidly and produces mono-specific stands that preclude beneficial native vegetation. Australian pines are are often uprooted by heavy winds and cause project maintenance difficulties. Beneficial native species of trees may be planted to replace these exotic trees and provide for shoreline protection and fish and wildlife habitat. Two species of introduced aquatic plants pose serious problems to the use and proper management of the project waters. They are water hyacinth and hydrilla. Both of these plants exhibit an explosive growth potential and quickly squeeze out more beneficial species. Navigation channels would quickly become plugged with these plants without management. Control operations are performed through contract to the State or private businesses. Mechanical systems may be used to clear navigation trails and application of EPA approved herbicides will be used to limit plant populations to acceptable levels. Some native species of aquatic plants restrict use of protected shallow water navigation trails in Lake Okeechobee. These plants will be treated to maintain the historic trail system. Other vegetation management activities may be carried out as problems or opportunities with other plants develop.

2-4.7 Reporting Statistics of the Natural Resource Management Program and Costs. The resource management staff collects data on monthly visitation at specific Federal, State and local recreation areas. They furnish information regarding operation and maintenance costs, capital improvements costs, fees collected, and levels of current staff. This data is compiled in the Natural Resource Management System (NRMS) report and updated annually.

2-5 OPERATION AND MAINTENANCE PROGRAMS

2-5.1 The following programs and policies are utilized in the day to day operation of the C&SF Project.

2-5.2 The Lake is operated according to a seasonal regulation schedule which fluctuates between 15.5 and 17.5 feet. When the lake stage is within these established conservation pool levels, water is distributed by the South Florida Water Management District for water supply. When lake stages exceed these levels, the Corps of Engineers is responsible for regulatory releases for flood control. When the regulation schedule for the Lake was developed, priorities for the Corps regulatory releases were included. The first priority is for agricultural canals. These releases are used in irrigation, conservation and for freshwater input to the Everglades National Park. Once this priority is met water is released into the Caloosahatchee River and then the St. Lucie Canal. The order is reversed for terminating releases. The maximum discharge capacity for the Caloosahatchee Canal is 9,300 cubic feet per second and 17,000 cubic feet per second for the St. Lucie Canal. See Addendum

2-5.3 Maintenance Dredging and Disposal. Maintenance dredging of the Okeechobee Waterway and disposal of dredged material are necessary in order to maintain authorized channel depths for continued operation. Shoaling, the main reason for maintenance dredging, occurs primarily on the St. Lucie River near Stuart, around each lock facility, and on the Caloosahatchee River near Ft. Myers. Shoaling can reduce benefits derived from the flood control, water supply, navigation, and recreation. Numerous locations along the Waterway have been acquired by the State (SFWMD) for dredged material disposal.

2-5.4 Lock Operation and Maintenance. The Corps is responsible for the maintenance and operation of the five navigation locks on the Waterway. The hours of operation are 6:00 a.m. with the first lockage at 6:30 a.m. until 10:00 p.m. with the last lockage at 9:30 p.m. Crafts are locked through on a first come basis with priority given to Government crafts, commercial crafts and recreation crafts. Maintenance to a lock structure is scheduled, if possible, when the seasonal lockages are at their lowest.

2-5.5 The W.P. Franklin Lock has an experimental air bubble curtain to discourage manatees from swimming into the lock structure. Several minutes before the lock gates are opened, air is pumped through a special pipe set at the toe of the lock structure and the rising air creates a barrier or curtain for these endangered marine mammals. See Addendum

2-5.6 Maintenance of the Herbert Hoover Dike. It is the responsibility of the Corps to maintain the integrity of the Herbert Hoover Dike. To perform this mission, recreation activities are limited on the dike itself; access over and along the top is controlled. A program to protect the dike is underway. Stone revetment will be placed on the shoreline between elevations 9 and 23.5 ft. from Moore Haven to Okeechobee.

2-5.7 Encroachments. The Corps has the responsibility to resolve encroachments thereby reducing damages to project lands from unauthorized use. During late 1985, a boundary survey and monumentation of the St. Lucie Canal was completed which identified several encroachments. Plans are underway for a boundary survey and monumentation and encroachments identification along the Caloosahatchee River. With boundaries clearly identified encroachments will be efficiently monitored and resolved.

2-5.8 Hurricane Emergency Program. The Corps is responsible for emergency operation and inspection of Corps facilities and equipment during any emergency. The South Florida Area Office is responsible for having all necessary equipment and personnel ready and trained. After receiving notification of an impending disaster, the Area Office will implement their emergency program in stages. The first stage is prior to the occurrence of the disaster and consists of measures to protect property and lives. In the second stage, during the actual occurrence, the situation is monitored and reported to the District Office. The third stage consists of an initial damage assessment as soon as conditions permit. The last stage is implemented upon declaration of a major disaster by the President. The activities performed under this stage are administered under Public Laws 84-99 and 93-288 by the District Emergency Operations Office.

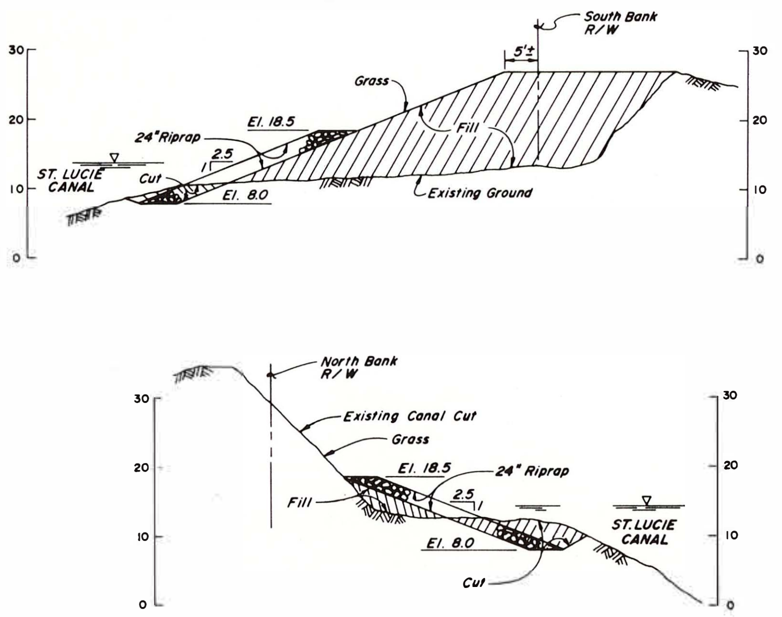
2-6 DESIGN AND CONSTRUCTION PROGRAMS

2-6.1 The C&SF Project is still under construction which has a changing impact on the Project's resources and public use potential.

2-6.2 Shoreline Erosion Program. Shoreline erosion affects public use in several ways. Severely eroded banks cause fishermen to climb down steep and/or high banks. Erosion may undermine boat launching ramps and sediment deposits may accumulate at ramps making them unusable. Trees fall into the waterway when undermined, and sediments cause shoaling which can hinder boating.

2-6.3 St. Lucie Canal. Bank erosion has been a problem on the St. Lucie Canal since its construction as a box-cut channel in the 1920's. The steep sides of the channel are susceptible to undermining and subsequent caving due to boat waves and flood flow releases. Erosion along some sections of the Canal has exceeded existing right-of-way. Some encroachment on private property has occurred, and at one location SR 76 is threatened by the erosion. As the banks erode, the material moves into the St. Lucie Estuary. Siltation of the estuary is occuring around the Palm City Bridge. As the sediments accumulate, depths become shallower and water velocities increase. This will push fresh water releases further into the estuary and affect recreation and commerical fishing. The silt is dredged from the navigation channels, however public use areas outside of the channel are being adversely affected.

2-6.4 The erosion process is generally uniform along the Canal and is expected to continue receding the banks at a rate of 1.6 feet per year. Several alternatives for shoreline protection are being studied to correct this problem. Figure 2F illustrates a typical section of riprap protection for the Canal. Shoreline protection may help both wildlife and aquatic life. Riprap would improve wildlife access to the water's edge. Vegetation could be planted at the upper and lower edges of the riprap which would provide food and cover to the smaller wildlife. Sessile organisms would attach to the rock and provide food for some aquatic life. See Addendum

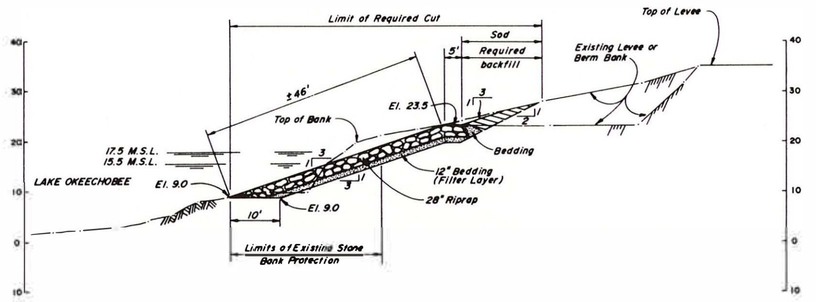


PROPOSED REVETMENT SECTIONS
ST. LUCIE CANAL

Figure 2F

2-6.5 Lake Okeechobee. The Herbert Hoover Dike consists of approximately 140 miles of levees constructed from a sandy material which is easily eroded. Wave action from normal storms, which can last for several days, and the wake from boats erode the shoreline of the dike. Prior to the 1978 lake regulation schedule, protection of the shoreline was accomplished as part of the O&M program. Approximately 50 miles of shoreline was protected with riprap or some other means. With the Lake's raise in 1978, the water surface is above the top of this existing revetment.

2-6.6 The Jacksonville District and the South Florida Water Management District are undertaking a major shoreline revetment program to protect the Herbert Hoover Dike. Approximately 65 miles of revetment will be placed along the shoreline from Moore Haven to Okeechobee over a period of eight years. Priorities for the work is based on the severity of erosion. As of January 1986, four contracts were awarded covering 20.4 miles. The last contract is planned for 1991. Figure 2G illustrates a typical section of one of the revetment alternatives designed for the levee.



TYPICAL REVETMENT SECTION
LAKE OKEECHOBEE

Figure 2G

2-6.7 The revetment will have some impacts on shoreline recreation use. The riprap will generally prohibit beaching of boats, reduce and hinder user access to the shoreline, remove existing vegetation and reduce the amount of land area available for recreation use. Alternative methods are being studied to make the revetment and recreation programs more compatible.

2-6.8 Caloosahatchee River. Erosion is a localized problem at some public use areas affecting shoreline access by fishermen and boaters.

2-6.9 Structure Rehabilitation and Replacement. A rehabilitation and replacement program is administered in order to convert existing structures to meet contemporary needs brought about by changes operating conditions and higher regulation levels authorized in 1968. See ADDENDUM

2-6.10 Construction will be initiated in the near future to convert Hurricane Gate No. 4 into a spillway structure. Hurricane Gate Structures No. 3 and 5 will be similarly converted in the future. These existing structures are popular fishing areas. Fishermen assemble on the shorelines near the structures and try to gain access onto the structures in order to fish the turbulent water associated with releases. Given this fishing pressure, facilities to accomodate fishing use should be considered in the replacement program. In addition to creating popular fishing areas, these 50-year old Hurricane Gate Structures are historically significant examples of water control engineering in the 1930's. Prior to replacement, measured drawings, photographic records and historic documentation are being compiled for the Historic American Engineering Record. This information can be used in future interpretive exhibits.

2-7 REGULATORY PROGRAMS

2-7.1 The Corps of Engineers is authorized to administer a regulatory program to control construction, dredging, and filling activities in the nation's waters. Under the Corps' historical permitting program, which began in 1899, and the current joint permitting program with the State, the Corps has processed permits on the Waterway and Lake Okeechobee for those activities shown in Table 2B. As can be seen from comparing the number of permit requests over the period from 1982 to 1984 to the number of requests over the preceeding 82 years, the relative rate of requests is increasing. This increase in permit activity directly relates to the development of the area. High growth areas are concentrated near Stuart and Ft. Myers. The area on the Caloosahatchee River near Ft. Myers has experienced the most intense development. The rate by which the shoreline along the River, and to a lesser extent on the Canal, is being subdivided into residential lots is increasing. Around Lake Okeechobee, development is occurring on the borrow canals along the northern and western sections. Accompanying this development, shorelines will be reshaped and docks and bulkheads constructed. The

PERMIT REQUESTS UNDER THE CORPS REGULATORY PROGRAM
1899-1984

	Aerial Cables		Bulkheads		Piers and Docks		Ramps		Marinas		Dredging	
	1982-1984	1899-1981	1982-1984	1899-1981	1982-1984	1899-1981	1982-1984	1899-1981	1982-1984	1899-1981	1982-1984	1899-1981
St. Lucie Canal	2	22	-	4	3	14	-	-	-	1	2	23
Lake Okeechobee	1	20	1	3	1	10	-	16	-	4	-	44
Caloosahatchee River	1	28	215	914	51	266	2	-	8	19	42	193

Table 2B

impacts of this increasing development on project resources has yet to be fully assessed. Possible impacts such as the loss of riparian vegetation and fish and wildlife habitats, visual encroachments, and potential safety hazards for recreation and navigation users will need to be considered together with benefits derived from the development of desirable waterfront property.

2-8 REAL ESTATE MANAGEMENT

2-8.1 This program includes the administration of all Corps real estate interests, outgrants and land disposals. Inspections to ensure protection of project lands are undertaken annually. Encroachments are monitored and resolved. Management of real estate interests requires coordination with the various agencies and private concerns who share property interests with the Corps. Most project lands are comprised of certifications for construction or easements for construction and operation and maintenance of project facilities. Of the total land area, fee title is held by the Federal government for about 480 acres at the five lock and dam sites and the Area Office.

2-8.2 On the St. Lucie Canal, the canal width varies from 200 to 350 feet from shoreline to shoreline, and the Corps right-of-way for operation and maintenance from 400 to 900 feet. Federal interest on the shoreline is primarily an easement to private property. At the St. Lucie Lock and Dam the Federal government owns 155 acres of land in fee for the operation and maintenance of structures, support facilities, and a recreation area.

2-8.3 On Lake Okeechobee the Corps has both easement and certification interests to lands required for project facilities. Typically, the easement or certification conveys to the Corps the ability to construct and maintain facilities where the Herbert Hoover Dike and related structures have been established. The State of Florida owns these lands and has additional land holdings adjacent to Corps project boundaries. These include islands within the Lake and several parcels of reclaimed lake bottom landward of the levee extending to the historic lake shoreline. A few small parcels within the lake levee are privately owned. The Federal government owns 203 acres of land on Lake Okeechobee in fee title at the Clewiston Area Office and the Port Mayaca and Moore Haven sites.

2-8.4 The width of the Caloosahatchee River varies from 300 to over 800 feet, and the Corps right-of-way for project operations from 390 to 800 feet. Federal interest on the shoreline is primarily an easement to private property. Several parcels within the right-of-way are in State ownership (SFWMD) for dredged material disposal. The Federal government owns 123 acres in fee title at the Ortona and W. P. Franklin sites.

2-9 RESOURCE MANAGEMENT COORDINATION

2-9.1 During this study, Federal and State agencies with active management responsibilities within the project area were asked to provide a description of their resource planning, design, construction, field management, public enforcement, and regulatory activities.

2-9.2 The Advisory Council on Historic Preservation, based on the National Historic Preservation Act of 1966, as amended (P.L. 89-665), and the Council's regulations (36 CFR Part 800) requires consulting with the Florida State Historic Preservation Officer to ensure historic and archaeological properties are fully considered in project planning.

2-9.3 U.S. Coast Guard has responsibility for installation and maintenance of navigation aids in the Waterway and enforcement of boating safety laws.

2-9.4 The U.S.D.A., Soil Conservation Service through local Soil and Water Conservation Districts provides assistance throughout the project area to land users in planning and application of practices needed for the conservation of soil, water and related resources. They are currently involved in three significant projects:

a. The Taylor Creek-Nubbin Slough Rural Clean Water Project (in conjunction with several Federal, State, and local agencies) helps develop and certify water quality plans for land users, provides technical assistance for appropriate Best Management Practices, and assists in project monitoring and evaluation.

b. The South Florida Conservancy District Watershed Project is a small watershed project set up to help with floodwater control and agricultural water management problems. The project is limited to the South Florida Conservancy District on the south side of Lake Okeechobee in Palm Beach and Hendry Counties.

c. The St. Lucie Waterway Erosion Control Project (in conjunction with the Corps, SFWMD and the St. Lucie Soil and Water Conservation District) involves evaluating several different techniques to control erosion on the banks of the Waterway. The Soil Conservation Service provided plant materials for vegetative stabilization.

2-9.5 The U.S. D.A., Forest Service, National Forests in Florida coordinates the efforts of agencies at all levels of government and the private sector in developing and protecting the Florida National Scenic Trail (FNST). This trail was designated and added to the National Scenic Trails System by the Act of March 28, 1983, (97 Stat. 42, 16 U.S.C. 1244 (a)). A portion of the existing Florida Trail corridor and the preferred alternate route for the FNST are on project lands.

2-9.6 U.S. Fish and Wildlife Service of the Department of the Interior, based on the Fish and Wildlife Coordination Act of 1958 (P.L. 85-624) and the Endangered Species Act of 1973 (P.L. 93-205), requires consultation to ensure that conservation of fish and wildlife resources and protection of threatened and endangered species are fully considered in project planning.

2-9.7 South Florida Water Management District (SFWMD), as local sponsor of the C&SF Project, has played a major role in planning, construction and operation of project features. SFWMD operates and maintains structures, canals and other facilities that were built by the Corps as part of the Project. In addition, SFWMD has developed and operates the Okee-Tantie Recreation Area and is the cost sharing sponsor in developing the Port Mayaca Recreation Area. SFWMD is concerned with the purchase and management of lands and right-of-ways required for the Project. District programs and activities in the vicinity of the Waterway and Lake include:

a) a cooperative study with the Corps of Engineers and the USDA Soil Conservation Service to study methods for stabilization of the banks of the St. Lucie Canal in Martin County.

b) biological and other related environmental studies of the Caloosahatchee River and Estuary and the St. Lucie Estuary.

c) development of mathematical models and a plan for management of freshwater discharges from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries.

d) a special study to provide an assessment of water resources of Martin County.

e) a coastal flooding study of Lee County

f) land and water use surveys and resource inventories of various counties along the Okeechobee Waterway that were incorporated into the Water Use and Supply Development Plans.

g) various studies, in cooperation with the United States Geological Survey, of groundwater resources in Lee, Martin and St. Lucie Counties.

h) special studies of surface water availability, water quality and allocation of surface water resources in the Caloosahatchee, C-23, C-24, and C-25 Basins.

i) mapping of wetlands in Lee and Martin Counties.

2-9.8 In addition, SFWMD is in the process of developing, primarily in conjunction with the Corps, a series of major construction projects in the vicinity of the Okeechobee Waterway. These projects have been classified in three major groups, based on the current status of project development, as follows:

1. Design and Construction Projects

   a) Kissimmee River Demonstration
   b) Lake Okeechobee Revetment
   c) Lake Okeechobee Hurricane Gate Replacement
   d) Nicodemus Slough
   e) S-79 Bubble Curtain, (W.P. Franklin Lock and Dam)
   f) S-169 Flood Control, (Clewiston area culvert)

2. Planning and Coordination Projects

   a) C-131 Flow-way, (canal on northeast shore of the Lake, not constructed)
   b) L-8 Water Supply, (borrow canal south of Port Mayaca)
   c) St. Lucie Canal Rip-Rap, Settlement Basin

3. Non-Assigned Projects
   a) Raising the Lake Okeechobee Levee

2-9.9 Florida Game and Freshwater Fish Commission is charged with exercising all the non-judicial powers of the State with respect to wild animals and freshwater aquatic life. As part of its program on Lake Okeechobee, the Commission staff conducts fish population studies to assess the relative abundance of species, collects data through kreel surveys to determine estimates of sport fishing effort, harvest and success by species, and monitors the composition of the commercial fish harvest from the Lake. Activities on the Lake also include defining the areas open to commerical fishing, the installation of fish attractors, coordination with the Corps on maintaining boat trails and management planning for aquatic plant control to benefit fish and wildlife. The Commission staff processes requests for hunting and fishing information and all permits and tags required for freshwater commerical and sport fishing and hunting. Commission Game and Fish Wildlife Officers enforce the State's hunting and fishing regulations on the Project. See ADDENDUM

2-9.10 Florida Department of Natural Resources (DNR) is charged with the administration, supervision, developement and conservation of Florida's natural resources. Within the Department, separate divisions execute these responsibilities. DNR's Division of Recreation and Parks develops and operates Florida's recreation and park system. Two of their recreation areas are in the project area, the Pahokee State Recreation Area at Pahokee (on Lake Okeechobee) and the Everglades Reclamation State Historic Site at Lake Harbor. This Division also administers several programs and grants offering a variety of recreation opportunities. These programs include the Florida Recreation Development Assistance Program and the Florida Boating Improvement Program which have sponsored recreation development on the Project.

2-9.11 DNR's Division of State Lands administers a variety of programs related to the acquisition, management, and sale of State lands.

2-9.12 DNR's Division of Resource Management, Bureau of Aquatic Plant Research and Control issues permits for all aquatic growth removal on Lake Okeechobee and the Okeechobee Waterway. This Bureau, in a cooperative agreement with the Corps, assists in the administration of the Federal Aquatic Plant Control (APC) and Removal of Aquatic Growth (RAG) programs on the Project.

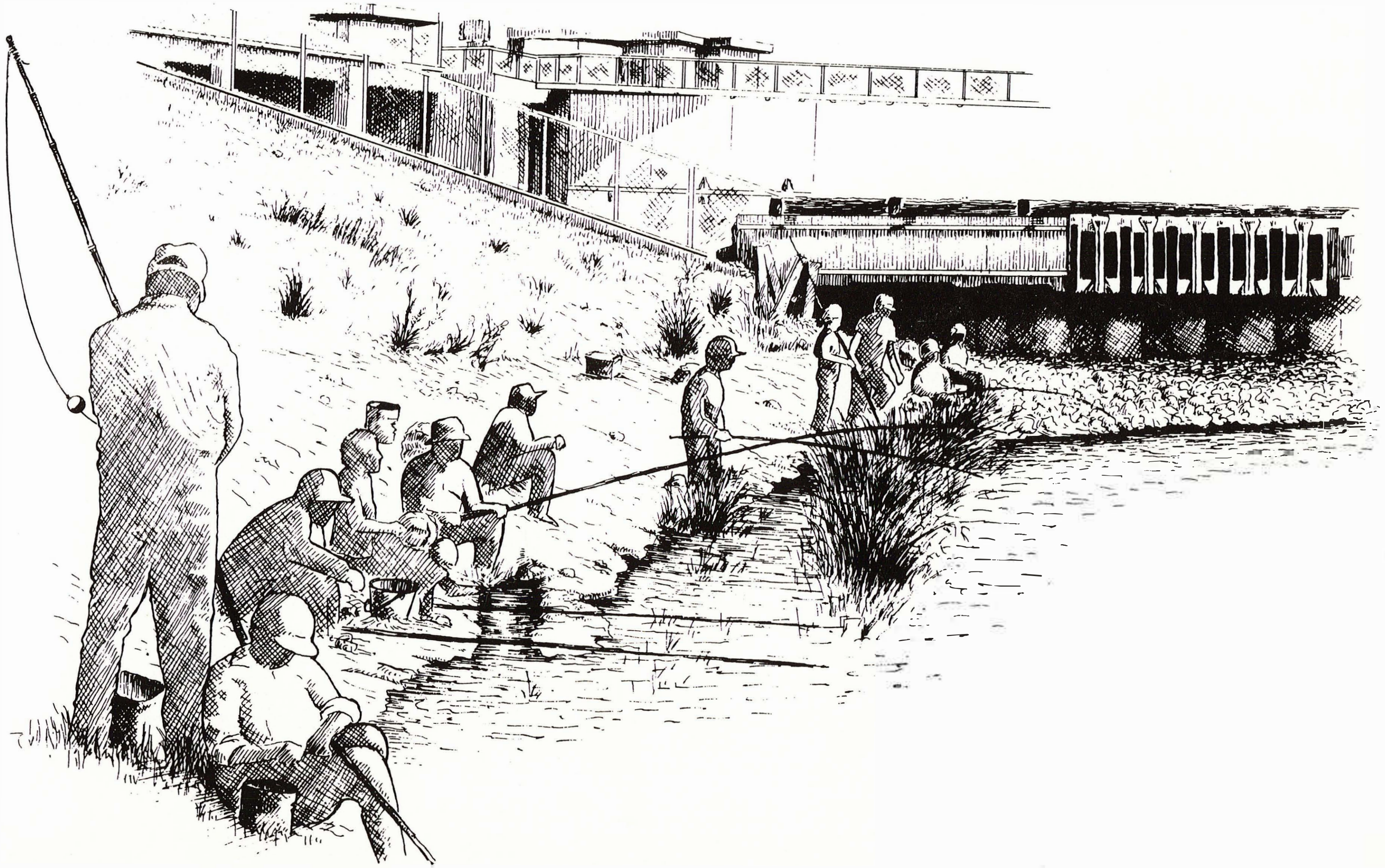
2-9.13 DNR's Division of Law Enforcement, Marine Patrol enforces laws regarding boating safety, saltwater fishing and coastal protection, primarily in the estuarine segments of the Waterway.

2-9.14 The Florida Department of Environmental Regulation (DER) exercises extensive regulatory responsibilities within the project area. They deal with regulation of water use within the State, as administered by the water management districts under the general supervision of the DER. DER is responsible for spills of petroleum and other pollutants in fresh surface waters and groundwaters and has the authority for enforcing air and water quality control.

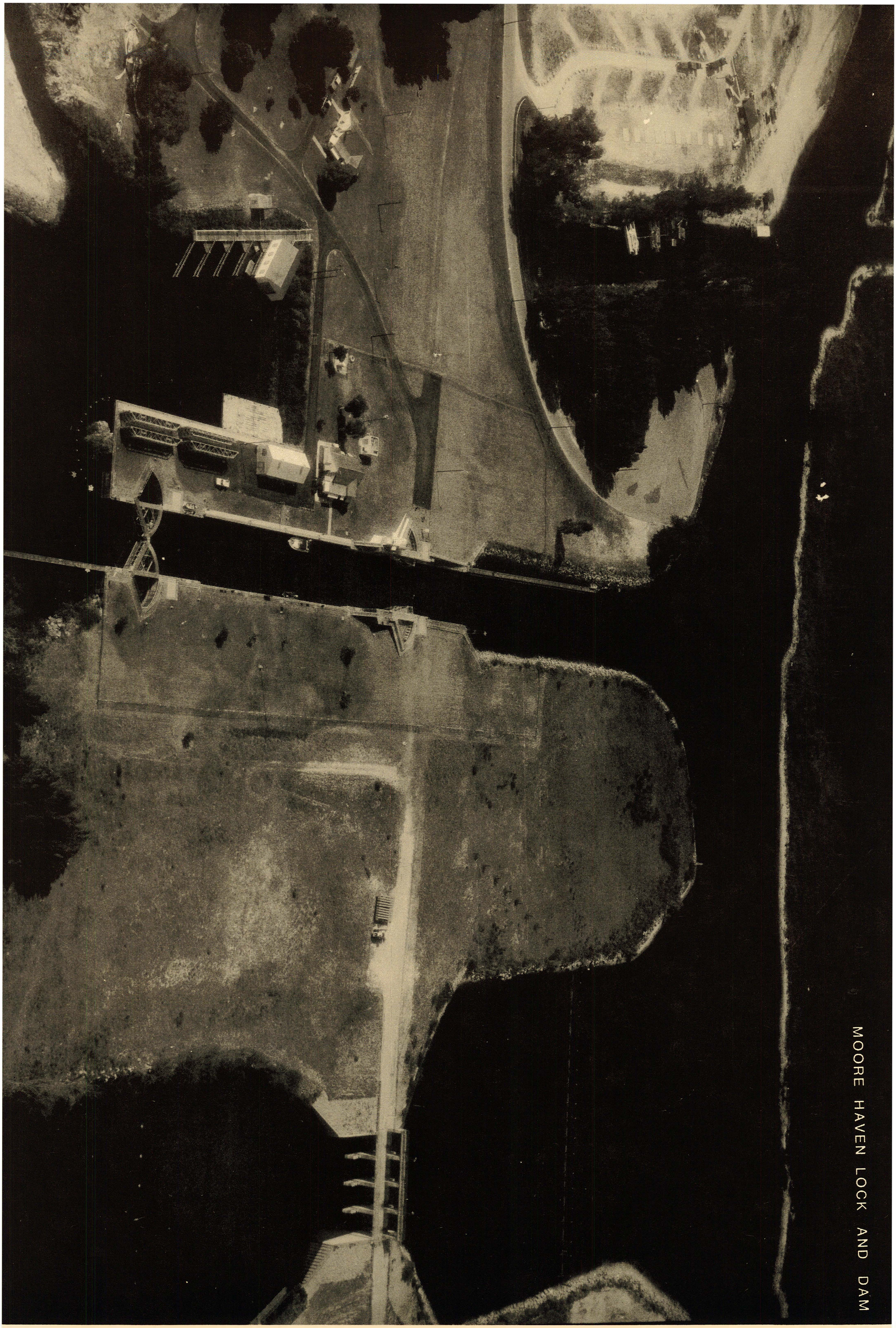
2-9.15 DER, through the Environmental Regulation Commission, classifies all waters of the state for their present and future most beneficial uses, and establishes water quality standards for each classification. They require permits for discharges to waters of the State and for dredging and filling in waters and wetlands of the State. The Department regulates the construction for water supply and waste disposal and the requirements for hazardous waste collection, transportation, storage, treatment and disposal. The Department administers the Water Management Lands Trust Fund which provides funds from the state documentary stamp tax to be used by the water management districts to purchase land that is important for water management purposes.

2-9.16 Florida Department of Transportation is responsible for State and Federal highways, the State Bikeways Plan, Scenic Highways, and various parks and rest areas. One such wayside park is located off SR 76 on the banks of the St. Lucie Canal near Port Mayaca.

2-9.17 Florida Trail Association volunteers cooperate with State and Federal agencies, as well as private landowners, to develop and maintain the Florida Trail from the Everglades to the Panhandle. Currently, portions of the levee system around Lake Okeechobee are used as part of this continuous, cross-country * trail. The Florida Trail Association is a private non-profit organization. *



Bank Fishing at Port Mayaca Lock



MOORE HAVEN LOCK AND DAM

PLANNING ANALYSIS PART III

PHASE I

CENTRAL AND SOUTHERN FLORIDA PROJECT

Lake Okeechobee
Okeechobee Waterway
Master Plan

Addendum (continued):

Page 3-8

√ 3-9.19 Mammals. There are 34 native species of mammals occurring in southern Florida, plus ten introduced species which are known to be established. The following list contains species frequently * associated with habitats found within the waterway. * Species marked with two astrisks (**) are recognized as endangered, threatened, or of special concern.

Add these items to "Mammals" list that follows Par. 3-9.19

** Everglades mink	Mustela vison evergladensis
** Florida panther	Felis concolor
** Sherman's fox squirrel	Sciurus niger shermani
** Mangrove fox squirrel	Sciurus niger avicennia

Page 5-1, Figure 5B
√ Figure revised as shown.

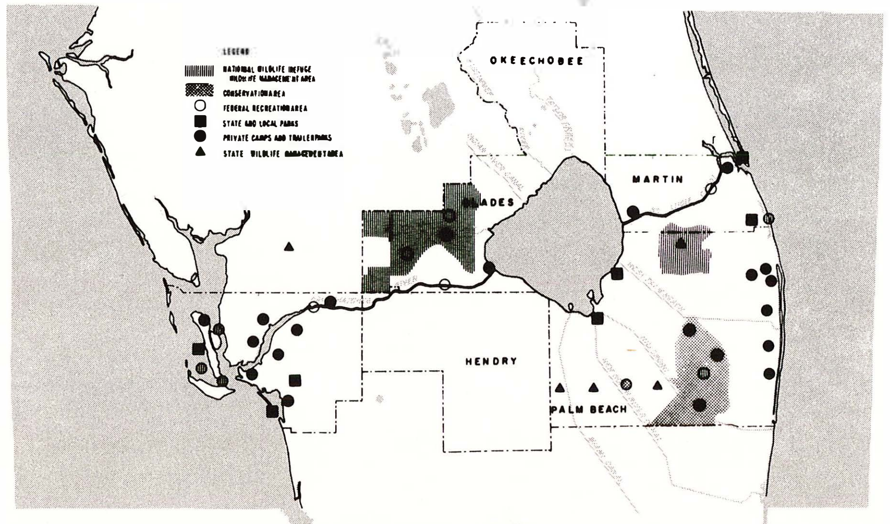

LEGEND
NATIONAL WILDLIFE REFUGE WILDLIFE MANAGEMENT AREA
CONSERVATION AREA
FEDERAL RECREATION AREA
STATE AND LOCAL PARKS
PRIVATE CAMPS AND TRAILERPARKS
STATE WILDLIFE MANAGEMENT AREA
OKEECHOBEE
GLADES
MARTIN
HENDRY
PALM BEACH

Figure 5B

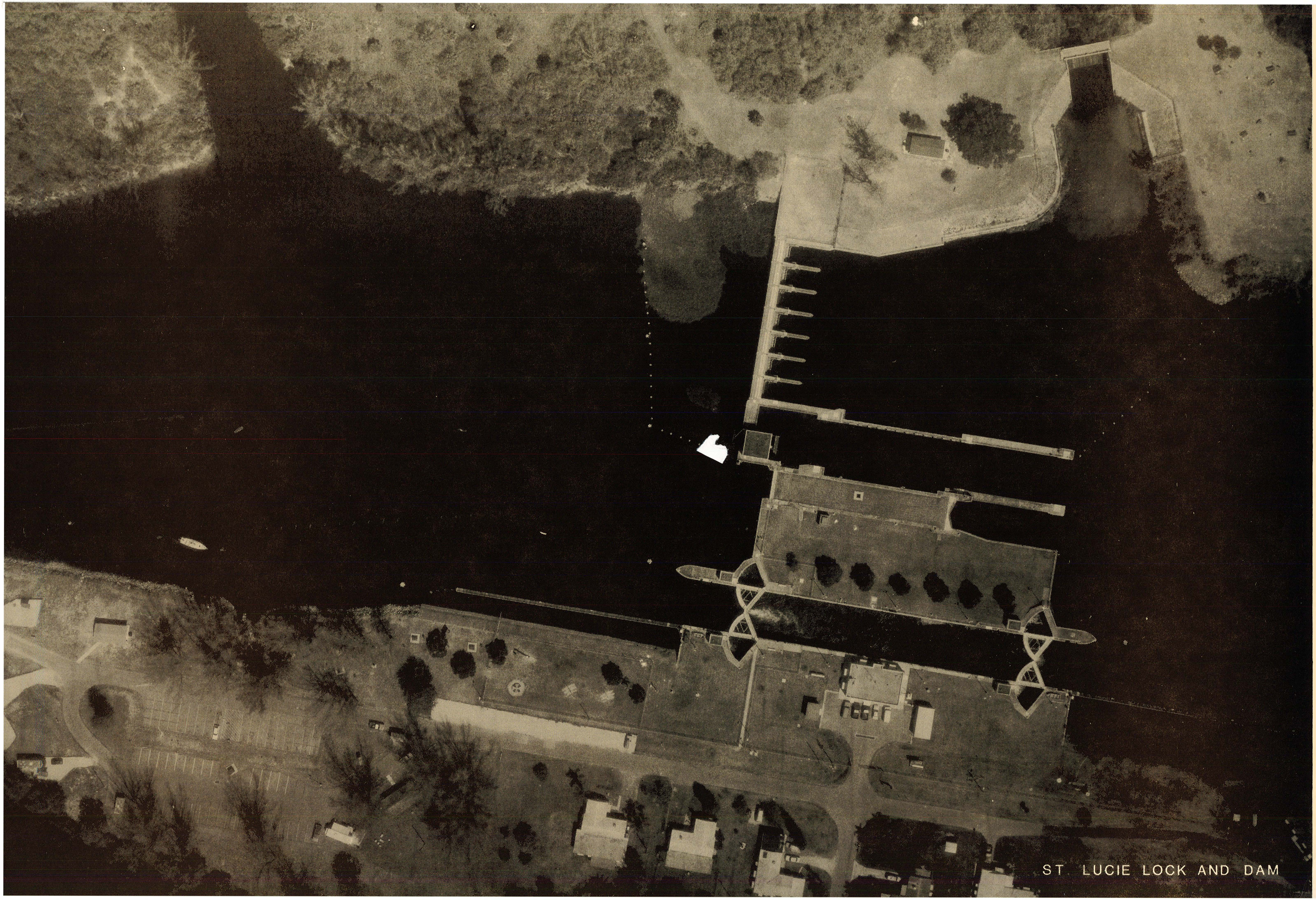
√ Page 5-3, Table 5E
Last 2 columns corrected.

TABLE 5E

PROJECTED NRMS RECREATION DEMAND-SUPPLY-NEEDS

Activity	1984 Project User Occassions (Normal Weekend Day)	2030 Project User Occassions (Normal Weekend Day)	1985 Project Existing Supply	Facilities ** Required to Meet Current Demand	Facilities ** Required to Meet 2030 Demand	Additional Supply to Meet 2030 Demand
Boating	5,180	12,432	75 lanes	32-(52) lanes	78-(124) lanes	3-(49) lanes
Sightseeing*	10,657	25,577	-	-		-
Fishing (non-boat)	9,964	23,914	7 piers & catwalks (1,500 L.F.)	59,784 L.F. (includes shore-line)	143,484 L.F. (includes shore-line)	Cannot be determined
Picnicking	4,084	9,802	323 tables	(408)-510 tables	(980)-1,225 tables	(657)-902 tables
Camping	2,762	6,629	812 sites	(552)-691 sites	(1,326)-1,657 sites	(514)-845 sites
Swimming	1,020	2,448	430 L.F. shoreline	2,550 L.F. shoreline	(408)-6,120 L.F. shoreline	(0)-5,690 L.F. shoreline
Hunting	299	718	35,000 acres marsh on Lake Okeechobee	5,382 acres	15,078 acres	-

* Sightseeing occurs at all sites. Five Corps Lock and Dam Sites are open to the public.
** The range in facilities required reflects both Corps of Engineers Standards and SCORP "Use Guidlines". The Corps standard is shown in parentheses ().



ST. LUCIE LOCK AND DAM

NATURAL RESOURCES

NATURAL RESOURCES

3-0.1 The following chapter describes a number of natural resource characteristics that influence planning for the development and management of project resources for public use. A review of these provides a general understanding of resource potentials and limitations. As with earlier report material, this section continues to identify the complexity and diversity of resource conditions on the Project and the resulting challenge involved in developing objective management decisions. Much of the material in this chapter was condensed from "An Environmental Assessment Related to the Construction, Use and Maintenance of the Okeechobee Waterway, Florida", prepared by the Jacksonville District in 1981.

3-1 CLIMATE

3-1.1 The study area is in the southern portion of the temperate zone and is greatly influenced by its proximity to the Atlantic Ocean and the Gulf of Mexico. The climate is often described as subtropical. Summers are long, warm, and wet, while winters are relatively dry and mild with short intermittent cool periods.

3-1.2 Rainfall over the study area averages about 55 inches a year with slightly more falling along the coasts than in the central areas. During the summer rainy season (May or June through October) about 75% of the total annual rainfall occurs. This rainfall is supplied by local, short-lived thunderstorms which typically build up during the afternoon hours. The local nature of summer storms has an interesting pattern with respect to Lake Okeechobee. As storms move towards the Lake, they are forced to rise, then are forced back. This phenomenon results in approximately 30% less rainfall over the Lake than its surrounding area. Catastrophic rainfall may result from the presence of tropical weather systems in the form of tropical depressions or hurricanes. Rainfall in the winter months is sporadic and comes from a few rain events that are generally of widespread geographic extent. In the winter there is a high percentage of cloudless days.

3-1.3 Temperatures are moderately high from June through September and pleasantly cool from November through April. Mean summer temperature is about 81° which is only 12° higher than the mean winter temperature. Frost occurs most years except in coastal areas.

3-1.4 Average wind speed is 9-10 mph along the coast, and about half this speed at the Lake. Prevailing winds are easterly during the summer, with the direction varying during the rest of the year. The spring and fall transition periods generally have the highest wind speeds.

3-1.5 There are two significant influences on recreation use resulting from the area's climate. Because of mild temperatures and dry conditions, peak recreation use occurs during the winter season, November through April. The superb winter weather draws many visitors from Northern states to the area. The second major impact of climate on public use occurs during prolonged periods of drought. These dry periods can lead to significantly lower water tables and lake levels resulting in serious water supply shortages. Water control structures, including the navigation locks, have been closed to recreation and navigation boating under these conditions. On occassion, boat ramps on the Lake have been unusable during extreme dry conditions.

3-2 GEOLOGY

3-2.1 The entire project area is underlain by at least 14,000 feet of sedimentary strata. Sediments in the upper few hundred feet consist mostly of noncompetent beds of clastic materials such as sands, silts, clays, and shell beds. These are underlain by competent strata of carbonate limestone or dolomites bearing artesian water. Sediments exposed on the surface range from Miocene to Holocene. Geologic, soil and physiographic features are directly or indirectly the result of climatic fluctuations during the Pleistocene, when glaciers waxed and waned over vast land areas, causing periodic inundation of this region by rising and falling ocean levels. Surficial drainage patterns are a result of sandy terraces deposited when the sea level was higher than at present. In general, the entire study area region is so flat that, historically much surface water drainage was by overland sheet flow and poorly defined sloughs.

3-3 HYDROLOGY

3-3.1 The Okeechobee Waterway is located in a hydrologic basin which covers an area of approximately 18,000 square miles, encompassing part of central and all of south Florida. The topography of the area is generally flat, and the lack of topographic relief makes clear delineation of drainage basins difficult. High water tables make the separation of ground water and surface water sometimes academic. In some areas, as little as 4 to 6 inches of rain could typically use up all available ground water storage space, resulting in no separation of ground water and surface water.

3-3.2 Historically, surface water in what is now the Orlando area on the northern end of the basin began as overland flow into the lakes and marshes of the upper Kissimmee Basin. Under relatively normal conditions, runoff was stored in the natural depressions and lakes. In years of heavy rainfall, surface water would overflow these depressions and move southward to ultimately reach Lake Okeechobee, joining runoff generated from lands adjacent to the Kissimmee River Basin. Water levels in Lake Okeechobee would rise due to heavy inflow and, with no major outlets, water would overflow the southern rim and gently flow overland into the Everglades and, to a much lesser extent, to the southwest toward Lake Hicpochee. See ADDENDUM

3-3.3 In its natural condition, the Caloosahatchee River had its source in the sawgrass marsh near Lake Hicpochee. It meandered 25 miles westward through a series of lakes to a location just east of La Belle, where it encountered a reach of rapids. Thenceforth the meandering stream/river channel and water surface were practically level. For the lower 29 miles, the river was a tidal estuary 1/2 to 3/4 mile wide.

3-3.4 Before the St. Lucie Canal was constructed, the drainage of the Martin County area consisted of the Allapattah Marsh, the North and South Forks of the St. Lucie River and the Loxahatchee River. The Allapattah Flats, draining the western part of the county, consisted of a generally marshy area which sloped gently north and south to merge with the headwaters of the St. Johns River to the North and with the Hungry Land Slough area of Palm Beach County to the South. In addition to this north-south drainage, there was also natural drainage to the Atlantic Ocean on the east and to Lake Okeechobee on the west. Records indicate a sizeable amount of freshwater flowed in the St. Lucie River prior to the Canal's construction. In addition, the St. Lucie Estuary was less saline due to a smaller tidal exchange at that time.

3-3.5 The entire hydrologic basin is now under the regulatory jurisdiction of the South Florida Water Management District (SFWMD). A highly complex system of drainage canals and water control structures has been constructed to manage surface water. The major components of this system may be thought of as the Kissimmee River on the northwest, Lake Okeechobee in the center, numerous drainage canals to the south, the St. Lucie Canal to the east and the Caloosahatchee River to the west. The implementation of this system is part of a 100 year period of drainage and canal construction that has altered the hydrology of all of South Florida. See ADDENDUM

3-3.6 Lake Okeechobee plays an important role at the center of this system. It has been modified by a full century of construction to alleviate flooding problems. Prior to any attempt by the State or the Federal Government to control the water level and to drain the Everglades, Lake Okeechobee had a normal elevation of about 20.5 feet above sea level and a normal fluctuation of 2.5 feet. Originally, when the Lake's water surface was at 20.5 feet, the major portion of the vast Everglades area to the southeast of the Lake was under water. The Lake is now diked to allow considerable storage and a series of structures allow water to flow either in or out through numerous outlets. Lake levels are controlled under a schedule placed into effect during May 1978. The schedule varies the levels between elevation 15.5 and 17.5 ft. Each year, in advance of the hurricane season the Lake level is drawn down to elevation 15.5. The drawdown begins on the first of January and is complete by the first of June. The Water surface is then allowed to rise to elevation 16.5 by mid-September and 17.5 by the end of September where it is held until the first of January.

3-3.7 The hydroperiod of the Lake is controlled, permitting water levels to fluctuate with flood and drought conditions and with the demand for water supply. Drought conditions are more likely to occur and the Lake level will frequently fall below the normal range of regulation during dry months and regulatory discharges will be curtailed. Occassionally dry conditions have persisted over several months and only releases for water supply occur. Flood conditions are infrequent and typically of shorter duration since lake levels can be efficiently regulated to reach normal range in a matter of weeks. Flood conditions are most likely to occur from June to September with tropical storm events.

3-3.8 The Caloosatchee River receives water from Lake Okeechobee, and is a natural drainage outlet for stormwater runoff from adjacent land. The River drains an area of about 390 square miles upstream of the Ortona Lock. The drainage basin for the area downstream of the Ortona Lock is about 500 square miles. The total area is less than the original preproject drainage area. This is due to manmade canals which have diverted some of the surface runoff originally flowing into the River. Data from gaging stations show that the lake water discharged through the Moore Haven Lock into the Caloosahatchee River only constitutes 55 percent of total flow at the Ortona Lock and 36 percent of flow at the Franklin Lock. Average flow values show daily discharges for the River ranged from as high as 21,400 cubic feet per second to zero discharge. The zero discharges usually occurred in dry months for a one or two month duration. During that time, only leakage and lockage water was released and the River became quite calm.

3-3.9 The St. Lucie Canal releases water from Lake Okeechobee. Unlike the Caloosahatchee River, the Canal does not have additional, extensive drainage basins. Canal flows are highly regulated by means of gated control structures adjacent to the Port Mayaca Lock and St. Lucie Lock. Records of flows at the St. Lucie Lock over a 30 year period show a range from 11,500 cubic feet per second to periods of zero flow lasting two to three months. See Addendum

3-4 WATER QUALITY

3-4.1 State of Florida surface water standards for class 1A, drinking water supply, are met in Lake Okeechobee and the portion of the Caloosahatchee River from the Franklin Lock eastward to the Lee County line. With respect to dissolved oxygen concentrations, class 1A standards often are not met in the River. The remainder of the Waterway is class III, designated for recreation and propagation of fish and wildlife. A small area at the western terminus of the Waterway in San Carlos Bay is identified as class II which is designated for shellfish harvesting.

3-4.2 Several studies have investigated water-quality trends taking place in the Lake. Most recent reports of water quality conditions note high concentrations of dissolved solids including chloride, calcium, and magnesium concentrations. While no significant water quality trends were identified during the most recent intensive study, some significant differences were observed when data were compared with data reported in earlier literature. Comparison of the recent water quality data of Lake Okeechobee with critical values for common trophic state indicators resulted in a subjective assessment of "eutrophic." Factors which have been identified as contributing to this condition include nutrient loadings from the Kissimmee drainage system, backpumping from agricultural areas south of the Lake, dissolution of the Lake bottom, and evaporative concentration of dissolved substances.

3-4.3 The St. Lucie Canal presents a special case as there had not been a river or other major water course in most of this region before its construction. Water quality in the St. Lucie Estuary has been affected by the operation of the St. Lucie Canal, which has contributed large volumes of turbid freshwater and transported sediments to the estuary. Effects on the fish and fisheries resulting from these inputs have been the subject of numerous studies. Heavy freshwater releases have been judged to be deleterious and are now more strictly controlled by the Jacksonville District.

3-4.4 Water quality in the Caloosahatchee River has been affected by construction of the link to Lake Okeechobee which increased the freshwater flow carried by the River, by the removal of rapids near LaBelle, by channelization and deepening projects carried out in the 1930's and 1960's, and by impoundment of sections of the River with the construction of locks and dams. These events removed wetlands, reduced detention times, and allowed for stratification in the deeper portions of two major impoundments of the River (Franklin Lock to Ortona Lock and Ortona Lock to Moore Haven Lock). Saltwater intrusion has been a major concern in the deepened Caloosahatchee River and was the stimulus for the construction of the Franklin Lock.

3-4.5 Groundwater. The project area has two separate types of aquifers, the deeper Floridan aquifer and the shallow aquifers, most of them contiguous with surface waters. Shallow aquifers are variable over the region and contain numerous, often localized subdivisions. Between the Floridan aquifer and the shallow aquifers is an aquiclude which confines the artesian Floridan aquifer. Water of the Floridan aquifer is not potable nor even useful for irrigation over most of the region. Abandoned, flowing wells from the Floridan aquifer are a widely recognized source of local mineral contamination of the shallow aquifers and surface waters. The aquiclude overlying the Floridan aquifer lies too deep to be penetrated by canal construction and maintenance. The shallow aquifers yield potable water throughout most of the region except around Lake Okeechobee where it is highly mineralized.

3-5 TOPOGRAPHY

3-5.1 The Project is located on the northern edge of the southernmost physiographic zone of the Florida peninsula. This southern zone is characterized by low-lying lands that did not reach elevations as high as the Atlantic Ridge on the eastern rim because they were not exposed to the high energy processes of the Atlantic shore. The topography in the project area is very flat. Terrain in the area does not exceed 2 percent in slope. The Lake and its associated canals and levees are the most visible portions of the vast area.

3-6 SOILS

3-6.1 There are over twenty soil types in south Florida which can be grouped into three general catagories: sand soils, organic soils, and marl soils. These soils have developed on top of the Florida limestone. Present sand soils are a result of modification of marine sands by soil water conditions and vegetation types. Organic soils (peats and mucks) were developed from dead plant material in marshes and swamps, where the saturated conditions prevented decomposition by bacteria and fungi. Vast areas of the Everglades developed these organic soils during the last 5,000 years. The Everglades contains the largest single body of organic soils in the world. Marl soil is a mixture of calcium carbonate with small amounts of clay. Some marl soils are sediments washed in from the sea. Fresh water marls were developed by calcareous algae.

3-6.2 Soils flanking Lake Okeechobee are organic peats and mucks. Periodic lake overflow, plus the water from annual rainfall, moved slowly southward over the almost level Everglades plain through the thick vegetation. Silts, clay, and organic colloids were carried in suspension during major overflows and deposited near the shore of the Lake where they intermixed with remnants of plants to form mucks. Most of the rest of the Everglades soils were derived from sawgrass and related marsh plants which decomposed to form a light, felty, brown fibrous peat with low mineral content. The formation of this organic soil was possibly due to the flooded conditions existing in the Everglades prior to massive drainage of the region. These organic soils generally existed south of Lake Okeechobee, with arms reaching northward along both the eastern and western shores of the Lake. The peat, when drained, properly fertilized, and augmented by minor elements becomes an excellent field soil. Today, these soils, together with the more highly prized muck soils, make up one of the richest agricultural regions on earth. These soils were originally 7 to 15 feet thick over the northern Everglades region. Farther east and west of the Lake are sandy soils that range from deep, white, droughty, very permeable sands on the east coast, to wet, gray or grayish-brown soils underlain by sandy clay or marl located mostly in the western reaches of the Waterway.

3-7 AIR QUALITY

3-7.1 The air quality of southern Florida is usually excellent because of two factors. First is the high frequency of cumulus cloud formation and thunderstorms which serve to mix air vertically and thus disperse pollutants from various sources. Second is the presence of the trade winds, especially in southeastern Florida, which move "new" air from the Atlantic Ocean over the land. These factors, however, operate primarily during the wet summer season, from June through September. Air quality during this period is typically very good and visibility excellent.

3-7.2 Conditions during the dry season are relatively more favorable for the confinement or accumulation of pollutants in the lower atmosphere. Air quality is generally much poorer with considerable haze obstructing visibility. Dry conditions in the latter part of the winter season are conducive to wildfires in the region which can create poor air quality conditions. Fires associated with agricultural practices also contribute to the degradation of air quality in the dry season.

3-8 VEGETATION

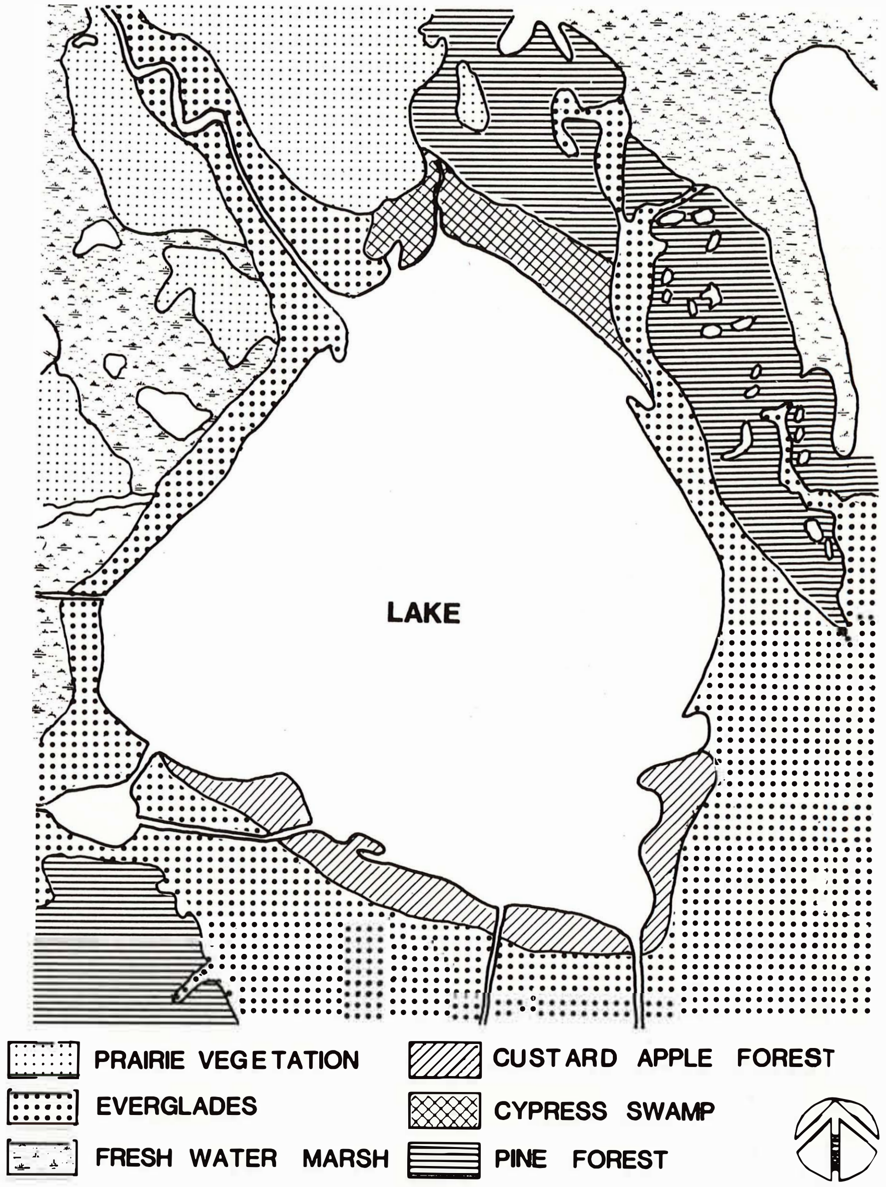
3-8.1 The original plant communities have been significantly altered by the settlement of the area and the simultaneous construction of extensive drainage systems. Few remnants of the communities that once existed are found along the waterway corridor or around Lake Okeechobee today.

3-8.2 St. Lucie Canal Region. The St. Lucie Canal alignment extended through eastern pineland flatwoods, dominated by slash pine and saw palmetto understory. Vegetation changes in this extensive part of the St. Lucie corridor range from total removal of the native vegetation to small areas of surviving functional pineland. The reasons are: (1) lumbering, (2) clearing and thinning for cattle pasture, (3) removal for citrus groves, and buildings, and (4) drainage. The result has the appearance of open grass with occassional cabbage palms, scattered settlement, occassional citrus groves, and limited pineland with several age classes. Drainage has had considerable effect in the pineland, and is difficult to evaluate. There is a shortened hydroperiod and for some of the pineland it is likely that the water nears or covers the surface only in extremely wet years. The resulting effect primarily limits the variety of the small woody and herbaceous understory plants. Most of the pineland has the naturalized guava as an understory plant among the natives such as saw palmetto. The guava is considered to be the result of recent invasion.

3-8.3 In some forested areas along the Canal, oak hammocks have succeeded the original pineland. Near Indiantown, oak hammocks appear intact with a number of mature trees. Mature oaks and large pines have been left for shade around buildings and along roads.

3-8.4 Mangrove forests and the associated buttonwood are limited to areas downstream of the St. Lucie Lock and Dam. The white mangrove is the most common and is dominant inland, and the red mangrove dominates the open water fringe of the estuary. Low sand ridges along the Southfork and the St. Lucie Rivers have cabbage palm, oak and occassional hardwoods.

3-8.5 Lake Okeechobee Region. The vegetation that now exists on Lake Okeechobee has developed in response to the Lake's confinement and regulation. It is considerably different from the vegetation of the lake area at the turn of this century. A version of a vegetation map prepared in 1914 is shown in Figure 3A. Originally there was a dense custard apple forest that



LAKE OKEECHOBEE VEGETATION AS DEPICTED IN 1914
Figure 3A

formed a swampy, irregular shore along the southern shoreline and partially up each side of the Lake. This custard apple belt varied in width from about a mile to 8 miles. Narrow extensions of the Everglades vegetation existed on the eastern and western shores, north of the custard apple forest. Dense cypress groves were extant behind low sand ridges on the very northern shoreline. The islands in the Lake, Observation, Ritta, Kreamer, and Torry were covered with dense groves of custard apple, cypress, ash and willow. see Addendum

3-8.6 Today little of the original shoreline vegetation remains. However, a few remnant plants from the old shoreline can still be seen near the outside of the dike. Near Port Mayaca old cypress, fig, and cabbage palms have been left at dwelling sites. Occassional cypress trees can be seen in fields around the Lake. Most lands surrounding the Lake, outside of the dike, have been converted from the custard apple swamp and sawgrass prairies to intensive agricultural uses, improved pastures, roadways, dikes and canals, and urban construction. Extensive seasonal marshes occur within the Fisheating Creek - Nicodemus Slough floodplain along the west side of the Lake. A preserved cypress swamp, Barley Barber, is located near the northeast shore.

3-8.7 A special surviving tree of the virgin vegetation near Moore Haven is noteworthy since it locates the spot where the Disston Canal (Three Mile Canal) entered the Lake. This tree, called the "Lone Cypress" is located about one mile downstream from the Moore Haven Lock. It has also been called the "Flat Top Cypress" and "Obervation Cypress" in old literature. This tree was used by boatmen as a marker for the Canal as they neared the southwest part of the Lake and now stands on high, dry land in downtown Moore Haven.

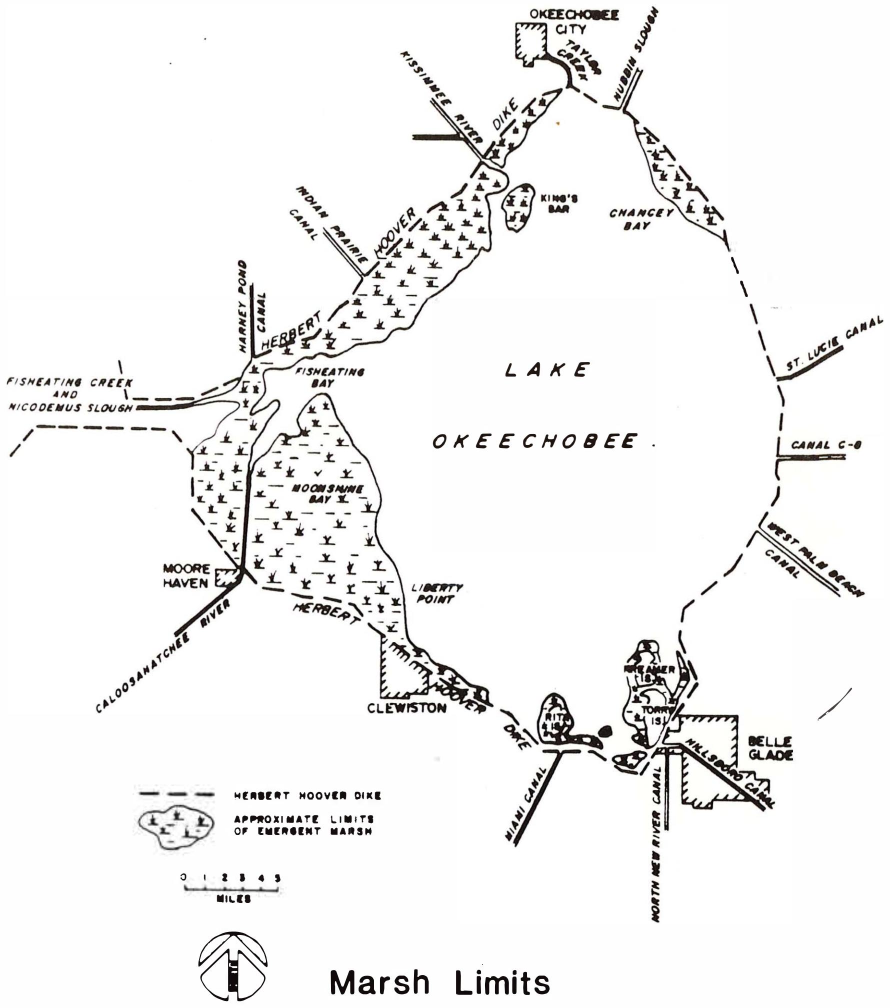
3-8.8 Today the vegetation inside the dike has distinct characteristics which are derived from implementation and operation of Project features. There are four distinct areas of vegetative cover, the dike and berm area in herbaceous species which are maintained by mowing, the berm areas and spoil islands that have been planted with exotic tree species, the littoral zone of emergent vegetation in the Lake, and the natural islands within the Lake in both upland and wetland species.

3-8.9 The dikes surrounding the Lake are maintained with herbaceous grasses to provide erosion control without affecting the structural integrity of the dike. To maintain this cover and to prevent the invasion of woody species, the dikes are mowed three times per year. They have been planted in Bermuda grass, Argentine bahia grass and brown millet. However, weedy invading species, such as Spanish needles, periwinkles, pepper grass and panic grass, to name a few, are extensive.

3-8.10 On the basis of programs recommended in 1938 and 1959, the Corps undertook tree planting operations on the levee berms and spoil islands created by construction of the Rim Canal. The major purpose of these programs was to establish a wide bank of vegetation lakeward of the levee to reduce wave energy and its impact on the exposed section of the levee. Planting consisted of bamboo, melaleuca, Brazillain pepper, willow and Australian pines. These species presently form dense bands of forest cover, from a few feet to several hundred feet in width, on the southern, western and northwestern shorelines. Although these plantings provide shade and much visual interest on the shoreline, some of the species have proven to be rapid invaders replacing natural successional species, and some are succumbing to disease and death due to high water levels.

3-8.11 On the Lake, extensive marshes occupy a band 1/2 to 9 miles wide from Clewiston on the southwest to the Kissimmee River on the north shore as shown in Figure 3B. Smaller areas of emergent marsh vegetation are found in other areas of the Lake and associated with the natural islands which were partially inundated when the Lake's regulation schedule was raised in 1978. These marshes on the Lake have all developed as a response to construction of the Project. There is a broad range of herbaceous and some woody species represented in the marsh community. A few of the major species are spikerush, beakrush, cattail, willow, bulrush and wire cordgrass. Several species of submerged and floating vegetation are associated with these marshes. These are both native and exotic species including hydrilla, water hyacinth, duck weed, water lettuce, water nymph, and bladderworts. Hydrilla is the most prevalent exotic, nuisance aquatic plant species on the Lake.

3-8.12 Some islands within Lake Okeechobee were formally used for agriculture and now afford limited upland for fig trees, guava, castor bean, citrus, royal palm, and several exotic landscape plants. Torpedo grass, napier grass, Burma reed, and water penny-wort form large areas of continuous and usually dense cover. There are also large areas of exposed soil. Tree vegetation in and around the exposed areas is mostly a scattering of small willow, custard apple and guava. Large exposed areas frequently become covered with water hemp, an annual herb, which spreads rapidly and can grow to dense thicknesses 12 feet in height within a few months.



Marsh Limits

Figure 3B

3-8.13 Caloosahatchee Region. Lake Hicpochee, once the headwaters of the Caloosahatchee, was contiguous with the sawgrass ~~marshes~~ of the Everglades and the surrounding area was wet prairie. A series of shallow lakes and marshes with abundant submerged and floating wetland vegetation extended from Lake Hicpochee to a reach of rapids just upstream from the town of La Belle. This stretch of lakes was bordered by hammocks, cypress and hardwood swamps. Below La Belle the river flowed through pine flatwoods where the terrain was flat and poorly drained, yet dry enough to retain pines and prevent the dominance of freshwater marsh vegetation.

3-8.14 Today, the organic land east and west of Lake Hicpochee is ditched and used for agriculture and housing. Lake Hicpochee has approximately 300 acres of open water backed by cattails, willows, and elderberry. Spatterdocks appear to be the main emergent vegetation. About five miles west of Lake

Hicpochee, hammocks occur within the river corridor. These are primarily cabbage palm-oak hammocks that once lined the wet prairie as it extended westward in a narrow band from Lake Hicpochee to the original headwaters of the River. The oaks are medium sized, and the cabbage palms of several age classes. The wet prairie is drained with some palms standing and is mostly grazed or cultivated and no longer a functional wetland.

3-8.15 The Coffee Mill Hammock complex east of the Ortona Lock consist mostly of oak-cabbage palm stands with some cypress, maple and hickory. In most cases, these forests are grazed and have limited understory invaded by Brazilian pepper.

3-8.16 The remaining pine flatwoods along the River are open canopied and in a secondary stage of succession with several ages of pines present. Older pine stands are usually replaced by oaks as a natural stage of succession.

3-8.17 East of the Franklin Lock, the River becomes an estuarine system where the shoreline vegetation is predominantly red and black mangrove forest invaded by Brazilian pepper. These forests border open water and saltwater marsh areas.

3-8.18 Submerged vegetation in the Caloosahatchee River is prominent both in the estuary and freshwater portions. In the estuary, submerged vegetation is comprised of algae and seagrass assemblages common to the coastal waters of southwest Florida. It is dominated by turtle grass, Cuban shoal grass, and manatee grass. Further upstream, where the interaction between freshwater flow and tidal influence begins to change the salinity, brackish and freshwater submerged plants appear. The vegetation in the freshwater section of the River is comprised of numerous species such as alligator weed, floating maiden cane, water lettuce, primrose willow and duck weed. Most of these floating plants are highly susceptible to movement by wind, and consequently, tend to concentrate on the edges of the River and in the oxbows for sheltered habitat. Another aquatic species, the water hyacinths, have presented a weed control problem on the River.

3-8.19 Plant species frequently found in the study area counties are listed below. Species marked with an asterisk (*) are those which are most commonly seen or are most representative of species in the area. Species marked with two asterisks (**) are either endangered, threatened, rare, or of special concern. Exotic species which are problematic in the area are marked with three asterisks (***).

PLANT LIST

	COMMON NAME	SCIENTIFIC NAME
***	Australian Pine	Casuarina spp.
***	Brazilian Pepper	Schinus terbinthifolius
*	Cabbage Palm	Sabal palmetto
*	Cypress	Taxodium spp.
	Guava	Psidium guajava
*	Live Oak	Quercus virginiana
***	Melaleuca	Melaleuca quinquenervia
*	Pond Apple	Ammona glabra
*	Red Maple	Acer rubrum
	Royal Palm	Roystonea elata
	Sea Grape	Coccoloba uvifera
*	Slash Pine	Pinus elliotti
*	Strangler Fig	Ficus auera
*	Wax Myrtle	Myrica cerifera
*	Wild Orange	Citrus spp.
	Willow	Salix spp.
	American Beautyberry	Callicarpa americana
	Buttonbush	Cephalanthus occidentalis
	Castor-bean	Ricinus communis
**	Florida Coontie	Zamia floridana
**	Four-petal Pawpaw	Asimina tetramera
	Groundsel	Baccharis spp.
	Pokeweed	Phytolacca americana
*	Saw palmetto	Serenoa repens
**	Sea-lavender	Mallotonia gnaphalodes
	Southern Elder	Sambucus simpsonii
	Spanish Bayonet	Yucca aloifolia
	Wild Coffee	Psychotria undata
	Wild Savory	Pyncnothymus rigidus
	Beach Sunflower	Helianthus debilis
	Broomsedge	Andropogan virginicus
**	Climbing Dayflower	Commelina gigas
**	Curtiss Mildweed	Asclepias curtissii
	Dog Fennel	Eupatorium spp.
	Purslane	Portulaca oleracea
*	Spanish Needles	Bidens pilosa
	Tick-trefoil	Meiboma cana
	Chain Fern	Woodwardia virginica
**	Hand Fern	Ophioglossum palmatum
	Leather Fern	Acrostichum spp.
*	Resurrection Fern	Polypodium polypodiodes
	Creeping Cucumber	Melothria pendula
	Greenbrier	Smilax spp.
**	Okeechobee Gourd	Cucurbita okeechobeenis
*	Poison Ivy	Rhus toxicodendron
	Trumpet Creeper	Campsis radicans
*	Wild Grape	Vitis spp.
*	Prickley Pear	Opuntia spp.
*	Air Plants	Tillandsia spp.
	Florida Butterfly Orchid	Epidendrum tampense
	Spanish Moss	Tillandsia usneoides
***	Alligator-weed	Alternanthera philoxeroides
	American Lotus	Nelumbo lutea
*	Arrowhead	Sagittaria spp.
	Arrowroot	Thalia geniculata
*	Beakrush	Rhynchospora spp.
	Bladderwort	Utricularia spp.
*	Bulrush	Scirpus spp.
*	Cattail	Typha spp.
***	Elephant-ear	Colocasia esculentum
***	Elodea	Egeria densa
***	Hydrilla	Hydrilla verticillata
*	Maidencane	Panicum hemitomon
*	Pickerelweed	Pontederia spp.
*	Sawgrass	Cladium jamaicense
	Spatterdock	Nuphar luteum
*	Spikerush	Eleocharis spp.
***	Water Hyacinth	Eichhornia crassipes
***	Water-lettuce	Pistia stratiotes
	Water Pennywort	Hydrocotyle umbellata

3-8.20 Plant Species of Particular Concern

a. Threatened Species:

1. Asclepias curtissii - Curtis milkweed is found in scrub vegetation, narrow bands of which extend from the north down both sides of Lake Okeechobee. Most of the possible original sites are now developed as towns, pasture or citrus groves.

2. Cereus gracilis - Prickly apple is found on Indian shell mounds and the edges of mangrove swamps in low thickets. Most of the coastal mounds have been destroyed. Restrictions imposed on mangrove type habitat should protect this species if any are now growing in the corridor.

3. Commelina gigas - Climbing-day flower has a range surrounding Lake Okeechobee. It was common in the custard apple zone south of the Lake. Most of its original habitat is now agricultural land or townsite. Only one plant was seen on Torry Island along a muck dike road. Cattle are known to graze it. Habitat requirements seem to negate the possibility that the actual Waterway corridor has any of these plants left.

4. Cucurbita okeechobeenis - Okeechobee Gourd had an original habitat in the muck soils of the custard apple forest around the southern part of Lake Okeechobee. Destruction of this

forest by the early part of the century removed its habitat. A few survirors have been seen in recent decades along roadsides and non-farmed areas. The berm areas adjacent to the Rim Canal are a potentially favorable habitat for this species.

5. Zamia floridana - Florida coontie is a pine-oak forest understory plant. Indians and early white settlers used it as food; and since it preferred high dry ground, its habitat was the first selected for building and agriculture. Dredged material sites should be checked for significant populations.

b. Species of Special Concern:

In the estuaries on both ends of the Waterway, mangroves still grow in spite of the heavy development. Current State regulations protect the mangroves in all areas.

3-9 FISH AND WILDLIFE

3-9.1 Fish. Studies of the fish fauna on the Project have been conducted to assess the effects of freshwater discharges into the St. Lucie and Caloosahatchee estuarine area and from fishery management efforts in Lake Okeechobee.

3-9.2 The eastern terminus of the Waterway is in the St. Lucie Estuary. This estuarine system includes the St. Lucie River proper and the south fork of the St. Lucie River which is joined by the Canal about 2 miles downstream of the St. Lucie Lock. The fish fauna of this portion of the Waterway is dominated by marine fishes even though the salinity is very low. In a study conducted by Gunter and Hall in 1957-1959, a total of 83 species of fishes were taken. Seventeen of these were freshwater species; the remainder (66) spawned in saltwater. The twelve most abundant species, listed in descending order of the numbers taken were as follows: striped mullet, yellowfin, menhaden, crocker, tidewater silverside, bay anchovy, silver jenny, sea catfish, black crappie, spot, white catfish, permit, weakfish (white trout), and red drum (red fish). Water entering the estuary from Lake Okeechobee via the St. Lucie Canal has been the focal point of controversy concerning fishing and other activities for many years. One of these issues at the heart of the controversy is the effect of freshwater discharge (i.e., reduced salinity), turbidity, and sedimentation on the fishery resource.

3-9.3 Little information exists on fishes and fisheries in the St. Lucie Canal. Generally, the Canal is steep sided, providing minimal littoral habitat for fishes. Prior to completion of the lock at Port Mayaca, the St. Lucie Canal had an open connection to Lake Okeechobee and was unobstructed to the St. Lucie Lock, 20 miles downstream. The fish fauna of this portion of the Canal is likely to be very similar to that of the Lake.

3-9.4 The first study specifically aimed at documenting the fish fauna of Lake Okeechobee was conducted from 1967 to 1969. Forty-three species were identified, of which 36 were true freshwater fishes and seven were marine species which invade freshwater. The strictly freshwater species were of widespread occurrence in peninsular Florida. Seven species of marine fishes collected in the Lake were: Atlantic needlefish, striped mullet, clown goby, hogchocker, snook, ladyfish, and tarpon. By 1974, the walking catfish was recognized as established in the Lake. Recent records also show the presence of the black acara, an exotic species native to South America. See ADDENDUM

3-9.5 Lake Okeechobee supports a large commerical and sport fishery which has been regulated by the Florida Game and Freshwater Fish Commission since 1947. The mainstay of the commercial fishery includes four species of catfish, black crappie ("speck"), blue gill, and redear fish. Several of these are important in sport fishing, which also includes chain pickerel and largemouth bass. There is limited sport fishing for snook and tarpon in Lake Okeechobee. In Florida, the snook is a species of special concern because of their diminishing numbers. See ADDENDUM

3-9.6 The western terminus of the Waterway is in the lower end of Charlotte Harbor. Many aspects of the Charlotte Harbor system have been described as an estuary which has comparatively little contamination. Recent studies of the fishes and fisheries of the estuary have been prompted by concerns over coastal development, and the effects of fresh-water releases through the Caloosahatchee River (Okeechobee Waterway) which enters the Harbor at San Carlos Bay.

3-9.7 The most extensive study of the fish fauna of the Harbor system by Wang and Raney (1971) compiled a list of 246 species occurring in the Harbor. The study area was overwhelmingly dominated by marine species, even in the low salinity estuary. Truly freshwater fishes, such as members of the sunfish and freshwater catfish families were seldom taken and then only at the uppermost stations near Beautiful Island in very low salinities. The eight most abundant species within the estuary were tidewater silverside, bay anchovy, striped mullet, mosquitofish, sea catfish, spot, hogchoker, and scaled sardine.

3-9.8 The freshwater portion of the River, above the W.P. Franklin Lock, has received little attention with respect to studies on fish. Gunter and Hall stated that the river fishery is of low quality, except on the downstream sides of the locks at Moore Haven and Ortona and near the "fresh-salt water mixing line." Their study was done prior to the construction of the W. P. Franklin Lock and Dam. Freshwater fishing at the Moore Haven and Ortona Locks is cited as being heaviest in early spring and late fall during periods of moderate discharge. Freshwater species include largemouth bass, sunfishes, catfish, and black crappie. Snook fishing is also popular. Recently, the walking catfish has been reported in the River above the W.P. Franklin Lock.

3-9.9 A report by the Florida Game and Fresh Water Fish Commission in 1967 identified the lack of underwater berms and filled owboxes as habitat problems along the Caloosahatchee River. The absence of acceptable littoral habitat along the River and the importance of the remaining oxbows, which are remnants of the original River, has been recognized in the South Florida Water Management's 1980 report on the Lower West Coast.

3-9.10 Lake Hicpochee represents a special case along the River where extensive littoral habitat is available immediately adjacent to the Waterway. According to the 1967 report by the Florida Game and Fresh Water Fish Commission, fish populations are inadequate there and could be greatly improved by raising the water level. This would increase populations of bream and bass. See ADDENDUM

3-9.11 Reptiles. Representatives of all four North American groups of reptiles; namely, crocodilians, turtles, lizards, and snakes, can be found currently utilizing habitats along the Project. Likewise, both anurans (frogs and toads) and salamanders, the two groups of amphibians, are represented. The following list of reptiles and amphibians contains species frequently found in the study area. Species marked with an asterisk (*) are those which are most commonly seen or are most representative of the area. Species marked with two asterisks (**) are recognized as endangered, threatened, or of special concern.

REPTILES AND AMPHIBIANS

COMMON NAME	SCIENTIFIC NAME
** American Alligator	Alligator mississippiensis
Florida Snapping Turtle	Chelydra serpentina
Stinkpot	Sternotherus odoratus

REPTILES AND AMPHIBIANS (Continued)

COMMON NAME	SCIENTIFIC NAME
* Striped Mud Turtle	Kinosternon bauri
Florida Mud Turtle	Kinosternon subrubrum
* Peninsula Cooter	Chrysemys floridana
* Florida Box Turtle	Terrapene carolina
Florida Red-belly	Chrysemys nelsoni
* Florida Chicken Turtle	Deirochelys reticularia
** Gopher Tortoise	Gopherus polyphemus
* Florida Softshell	Trianyx ferox
** Atlantic Green Turtle	Chelonia mydas
** Atlantic Hawksbill	Eretmochelys imbricata
** Atlantic Loggerhead	Caretta caretta
** Atlantic Leatherback	Demochelys coriacea
** Florida Scrub Lizard	Sceloporus woodi
Ground Skink	Scincella lateralis
* Southeastern Five-link Skink	Eumeces inexpectatus
Peninsula Mole Skink	Eumeces egregius
Six-lined Racerunner	Cnemidophorus sexlineatus
Glass Lizards	Ophisaurus spp.
* Florida Banded Water Snake	Natrix fasciata
Florida Green Water Snake	Natrix cyclopion
Brown Water Snake	Natrix taxispilota
Striped Swamp Snake	Liodytes alleni
S. Florida Black Swamp Snake	Seminatrix pygaea
* Eastern Garter Snake	Thamnophis sirtalis
* Peninusla Ribbon Snake	Thamnophis sauritus
Florida Brown Snake	Storeria dekayi
Eastern Hognose Snake	Heterodon platyrhinos
* Southern Ringneck Snake	Diadophis punctatus
* Rough Green Snake	Opheodrys aestivus
Eastern Mud Snake	Farancia abacura
* Southern Black Racer	Coluber constrictor
Eastern Coachwhip	Masticophis flagellum
** Eastern Indigo Snake	Drymarchon corais
Florida Pine Snake	Pituophis melanoleucus
* Yellow Rat Snake	Elaphe obsoleta
* Everglades Rat Snake	Elaphe obsoleta
* Corn Snake	Elaphe guttata
Florida Scarlet Snake	Cemophora coccinea
* Scarlet Kingsnake	Lampropeltis triangulum
* Florida Kingsnake	Lampropeltis getulus
* Green Anole	Anolis carolinensis
* Florida Cottonmouth	Agkistrodon piscivorus
* Eastern Coral Snake	Micrurus fulvius
* Dusky Pigmy Rattlesnake	Sistrurus miliarius
* Eastern Diamondback Rattlesnake	Crotalus adamanteus
* Greater Siren	Siren lacertina
Everglades Dwarf Siren	Pseudobranchus striatus
Two-toed Amphiuma	Amphiuma means
Peninsula Newt	Notophthalmus viridescens
Eastern Spadefoot Toad	Scaphiopus holbrooki
Eastern Narrow-mouthed Toad	Gastrophryne carolinensis
* Southern Toad	Bufo terrestris
* Oak Toad	Bufo quercicus
** Pine Barrens Tree Frog	Hyla andersonii
* Treefrogs	Hyla spp.
Little Grass Frog	Limnaoedus ocularis
Florida Chorus Frog	Pseudacris nigrita
Florida Cricket Frog	Acris gryllus
Greenhouse Frog	Eleutherodactylus planirostris
* Pig Frog	Rana grylio
* Southern Leapard Frog	Rana utricularia
** Florida Gopher Frog	Rana areolata

3-9.12 Perhaps the most notable among the reptiles which occur in the project area is the American alligator, one of Florida's largest reptiles, and North America's only freshwater crocodilian. The alligator prefers areas where dense littoral stands of grasses and sedges, or dense hardwood swamps provide breeding habitat.

3-9.13 A few reptile species are found in portions of the project area, or have notably large local populations. The ornate diamondback terrapin is found at the westernmost and easternmost ends, inland approximately to where the mangroves and salt marshes give way to freshwater habitats. The gopher tortoise in western Florida has its southernmost range on the Caloosahatchee River, west of central Glades County. The tortoise may burrow in the high berms along the banks of the Waterway. Large numbers of yellow and Everglades rat snakes inhabit the rows of Australian pines bordering the levee along the southern end of Lake Okeechobee, and a large population of brown snakes inhabit the riprap along the levee banks. Soft-shelled turtles are of concern as a commercial commodity to the fisheries in Lake Okeechobee. A six-year study, commencing in 1966, indicated a severe decline both in quantities caught and relative value of the catch during that period.

3-9.14 East of Lake Okeechobee along the St. Lucie Canal, there is little unique in the herpetofaunal community, except where the canal cuts through the eastern coastal ridge in northern Martin County. This ridge supports a population of gopher tortoises which displays some demographic characteristics which differ from the rest of the state's population.

3-9.15 Birds. The following list contains avian species frequently found in the study area. Species marked with an asterisk (*) are those which are most commonly seen or are most representative of the area. Species marked with two asterisks (**) are recoginzed as endangered, threatened, or of special concern. Exotic species which are problems in the area are marked with three asterisks (***).

BIRDS

COMMON NAME	SCIENTIFIC NAME
Pied-billed Grebe	Podilymbus podiceps
* Double-cresed Cormorant	Phalacrocorax auritus
* Anhinga	Anhinga anhinga
Mottled Duck	Anas fulvigula
Wood Duck	Aix sponsa
* American Coot	Fulica americana
* Common Gallinule	Gallinula chloropus
Purple Gallinule	Porphyrula martinica
* Brown Pelican	Pelecanus occidentalis
Gulls	Larus spp.
* Great Blue Heron	Ardea herodias
** Little Blue Heron	Florida caerulea
** Louisiana Heron	Hydranassa tricolor
* American Egret	Casmerodius albus
** Snowy Egret	Egretta thula
** Reddish Egret	Egretta rufescens
*** Cattle Egret	Bubulcus ibis
* Black-crowned Night Heron	Nycticorax nycticorax
* Yellow-crowned Night Heron	Nyctanassa violacea
* Green Heron	Butorides striatus
* Least Bitten	Ixobrychus exilis
** Wood Stork	Mycteria americana
** Roseate Spoonbill	Ajaia ajaja
** Sandhill Crane	Grus canadensis
** Limpkin	Aramus guarauna
* Glossy Ibis	Plegadis falcinellus
* White Ibis	Eudocimus albus
King Rail	Rallus elegans
Black-necked Stilt	Himantopus mexicanus
Killdeer	Charadrius vociferus
* Wild Turkey	Meleagris gallopavo
Bobwhite	Colinus virginianus
** Everglades Kite	Rostrhamus sociabilis
** Arctic Peregrine Falcon	Falco peregrinus fundrius
Hawks	Buteo spp.
** Bald Eagle	Haliaeetus leucooephalus
* Osprey	Pandion haliaetus
* Turkey Vulture	Cathartes aura
Black Vulture	Coragyps atratus

BIRDS
(Continued)

COMMON NAME	SCIENTIFIC NAME
** Crested Caracara	Polyborus plancus
** American Kestrel	Falco sparverius Paulus
Screech Owl	Otus asio
Great Horned Owl	Bubo virginanus
Barred Owl	Strix varia
Barn Owl	Tyto alba
** Burrowing Owl	Athene cunicularia
* Mourning Dove	Zenaida macroura
Chuck-will's-widow	Caprimulgus carolinensis
Red-headed Woodpecker	Melanerpes erythrocephalus
Pileated Woodpecker	Dryocopus pileatus
** Red-cockaded Woodpecker	Picoides borealis
Common Flicker	Colaptes auratus
* Red-bellied Woodpecker	Melanerpes carolinus
Downy Woodpecker	Picoides pubescens
** Hairy Woodpecker	Picoides villosus
Purple Martin	Progne subis
Crows	Corvus spp.
Blue Jay	Cyanocitta cristata
** Scrub Jay	Aphelocoma coerulescens
Carolina Wren	Thryothorus ludovicianus
Brown Thrasher	Toxostoma rufum
* Mockingbird	Mimus polyglottos
Eastern Bluebird	Sialia sialis
Loggerhead Shrike	Lanius ludovicianus
** Warblers	Dendroica spp.
* Red-winged Blackbird	Agelaius phoeniceus
Common Grackle	Quiscalus quiscula
* Boat-tailed Grackle	Quiscalus major
* Eastern Meadowlark	Sturnella magna
*** European Starling	Sturnus vulgaris
*** House Sparrow	Passer domesticus
* Cardinal	Cardinalis cardinalis
Rufous-sided Towhee	Pipilo erythrophthalmus
Smooth-billed Ani	Crotophaga ani
** Florida Grasshopper Sparrow	Ammodramus savannarum

3-9.16 Lake Okeechobee marshes provide a significant resource for feeding and nesting activities of several wading bird species. Many are considered to be of special concern by the State because of their rapidly declining populations resulting from wetland drainage and altered hydro-periods. In a five year study undertaken from 1977 to 1981 by SFWMD's Environmental Sciences Division, the wading bird population on Lake Okeechobee was observed and inventoried, specifically the population of white ibis, glossy ibis, great egrets, snowy egrets, cattle egrets, and wood storks. Little blue, great blue and Louisiana herons, and roseate spoonbills were also noted using the marsh for feeding and the islands for nesting. It was concluded that the Lake marshes provide an essential habitat that may be crucial for long term maintenance of these species. Extended high regulation stages could be detrimental to the bird population since the long term viability of the major vegetation communities requires periodic drying for regeneration.

3-9.17 The marshes of the Lake also provide year-round habitat for several species of waterfowl species including wood ducks, coots, and gallinules. The marshes are heavily used by migratory waterfowl.

3-9.18 Bald eagle nesting sites are known to occur on project lands and are monitored by the Florida Game and Freshwater Fish Commission staff. Two sites are currently active, one adjacent to Lake Okeechobee, the other along the Caloosahatchee River.

3-9.19 Mammals. There are 34 native species of mammals occurring in southern Florida, plus ten introduced species which are known to be established. The following list contains species frequently associated with aquatic habitats. Species marked with two asterisks (**) are recognized as endangered, threatened, or of special concern. See Addendum

MAMMALS

COMMON NAME	SCIENTIFIC NAME
Raccoon	Procyon lotor
Mink	Mustela vison
River otter	Lontra canadensis
Rice rat	Oryzomys palustris
Florida water rat	Neofiber alleni
Marsh rabbit	Sylvilagus palustris
** Manatee	Trichechus manatus
Bottlenose dolphin	Tursiops truncatus
** Everglades mink	Mustela vison everglades
** Florida panther	Felis concolor
** Sherman's fox squirrel	Sciurus niger shermani
** Mangrove fox squirrel	Sciurus niger avicennia

3-9.20 The raccoon is considered to abundant carnivore in southern Florida. extremely versatile, both in its habitat pre. and its tolerance for man.

3-9.21 The Florida water rat, or round-tailed muskrat, is found primarily in wet habitats, but is also known to live in burrows in seasonally wet areas with peat soils. It has been recorded in Martin, Palm Beach, and Hendry Counties, but is not common, and populations are localized, with large areas of potential habitat unoccupied.

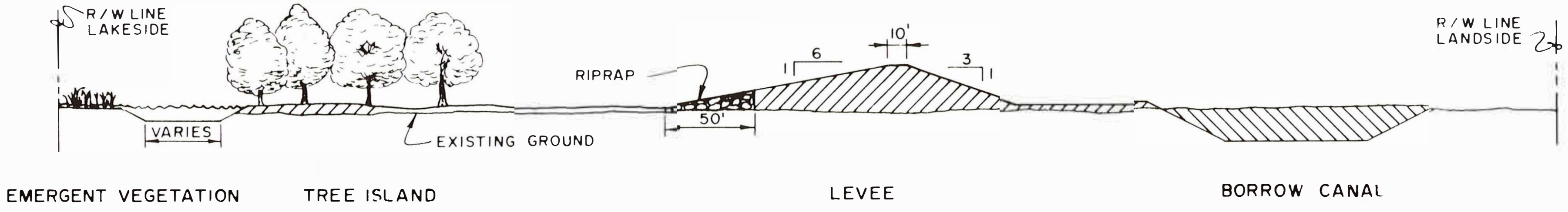
3-9.22 The manatee, a marine mammal, is found from North Carolina through the Gulf of Mexico and West Indies into northern South America, and is recognized as an endangered species. Manatees are found throughout the Caloosahatchee River, the St. Lucie Canal, and in some areas of Lake Okeechobee, particularly near the northern and northeastern shore.

3-9.23 The Atlantic bottle-nosed dolphin is the only other marine mammal to enter the Waterway. It is found on both coasts and is known to enter freshwater rivers.

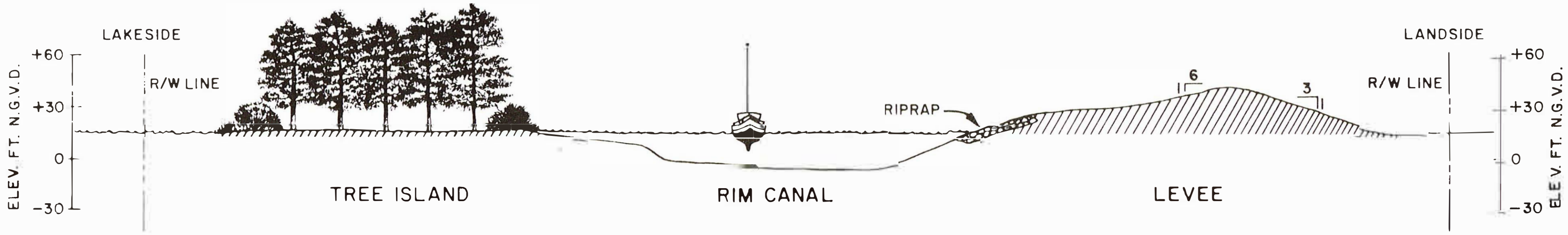
3-10 VISUAL RESOURCES

3-10.1 In this study the visual character of project resources has been described by identifying continuous systems of similar visual components. These components contribute or detract from visual quality.

3-10.2 The first visual system, called the waterway corridor, is primarily a linear body of water, with shoreline edges on both sides along its route. This is characteristic of the St. Lucie Canal, portions of the Rim Canal, and the Caloosahatchee River. Typical cross-sections of the waterway corridor are shown in Figure 3C. An important component is the shoreline vegetation. Naturalized riparian vegetation adds visual interest with a variety of heights, textures and colors. Continuity of vegetated shoreline enhances the sense of enclosure and privacy for boaters on the corridor. Shoreline vegetation also provides habitat for animals whose presence contributes to visual interest. Naturalized vegetation is particularly characteristic of the lower Caloosahatchee River where portions of the original shoreline and river oxbows have not been modified by channelization. On the Rim Canal the corridor is enhanced by shoreline trees planted on the berm and tree islands. However, these typically monospecific stands of exotic species do not have a large variety of understory and are plagued with disease and death.


R/W LINE LAKESIDE
VARIES
EXISTING GROUND
RIPRAP
50'
6
1
10'
3
1
R/W LINE LANDSIDE
EMERGENT VEGETATION
TREE ISLAND
LEVEE
BORROW CANAL

CROSS SECTION OF LEVEE LAKE OKEECHOBEE'S NORTHWEST SHORE


LAKESIDE
+60
+30
0
-30
ELEV. FT. N.G.V.D.
R/W LINE
RIPRAP
6
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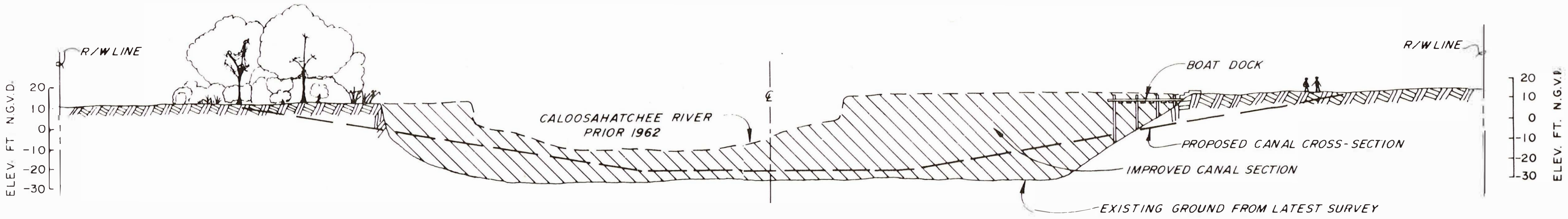
LANDSIDE
R/W LINE
TREE ISLAND
RIM CANAL
LEVEE

CROSS SECTION ON LAKE OKEECHOBEE'S SOUTHERN SHORE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CALOOSAHATCHEE RIVER PRIOR 1962
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BOAT DOCK
R/W LINE
PROPOSED CANAL CROSS-SECTION
IMPROVED CANAL SECTION
EXISTING GROUND FROM LATEST SURVEY

CROSS SECTION ON CALOOSAHATCHEE RIVER

Figure 3C

3-10.3 Components of the waterway corridor which detract from the visual quality include steep, eroding banks with toppled trees and dying vegetation, areas lacking vegetation, abandoned structures and boats, and the visual clutter of bulkheads, docks, signs, structures, satelite dishes and boathouses. High, steep banks are characteristic of the St. Lucie Canal from Port Mayaca to the St. Lucie Lock and of the Caloosahatchee River from Moore Haven to Ortona. From these portions of the waterway very little of the shoreline condition above the banks is perceived.

3-10.4 The second system of visual resources, called the open lake, is characterized by panoramic views and broad expanses of open water and marsh. Vegetated shorelines provide a backdrop and habitat for waterfowl, wading birds, reptiles, amphibians and occasional mammals whose presence add visual interest. These visual components are found on Lake Okeechobee. Several public use areas on the Lake have panoramic vistas. At two areas the panoramas are considerably expanded by using raised platforms, which are particularly effective in the very flat environment.

3-10.5 Most of the Project cannot be seen from major roads in the area. The St. Lucie Canal, with low visual quality, has the most exposure since two major roads cross the Canal and SR 76 closely parallels the Canal for 20 miles. The Caloosahatchee River can be viewed from five road crossings and both SR 80 and SR 78 parallel the River for short distances below La Belle. The River has good visual quality in these areas. The lack of topographic relief creates a particular impediment to viewing the Lake from the neighboring communities and circumferential roads. The Lake is obscurred by the levee, and in the flat terrain the levee is the most prominant landscape feature, monotonous in it's extensive length, regularity and lack of varied vegetation. Opportunities to view the Lake are limited and gained only by physically crossing over the levee.

CHAPTER 4

CULTURAL RESOURCES

4-1 REGIONAL LAND USE

4-1.1 The Phase I study area is located in Glades, Hendry, Lee, Martin, Palm Beach, and Okeechobee Counties. The relative percentages of land use in the study areas are given in Table 4A. The area has been altered by its recent settlement during this century. Extensive drainage and land reclamation have contributed to regional development as has the popularity of the coastal areas for urbanization. The dominant land use is for agriculture. In the southern region of Lake Okeechobee, highly organic soils are cultivated for sugar cane, sod, and winter vegetables. In the other areas the drier, more acid soils are used for improved and semi-improved pastures and citrus groves. Industrial development throughout the area is limited primarily to agricultural product processing plants and facilites.

4-1.2 Natural areas of the region are both upland and wetland ecosystems. Wetlands are the second largest land use area, followed by the forested upland areas. Although many wetlands have been drained throughout the area, parts of the remaining wetlands, because of their importance in potable water recharge and animal/plant productivity, have been preserved through Federal, State, or local programs.

4-1.3 Settlement has occurred principally along major transportation routes paralleling the Atlantic coastline. In Palm Beach County the coastal, urbanized area of 34 incorporated communities and environs forms a megalopolis extending north from Broward and Dade counties. A secondary concentration of population occurs in the Gulf coast communities of Lee County which have also developed along the coastal roads. Over 85% of the population in the six-county area is concentrated along the coasts; however, recent growth has been pushing further inland. A much smaller population concentration exists in the towns and communities around Lake Okeechobee, and along the St. Lucie Canal and Caloosahatchee River.

4-1.4 The two largest of the three Federal Seminole Indian reservations in Florida are located in the project area; Big Cypress Reservation (42,278 acres) in Hendry County and Brighton Reservation (35,805 acres) in Glades County.

4-2 POPULATION

4-2.1 The current resident populations and the projected populations to 2030 of the counties in the study area are shown in Table 4B. Population is expected to grow by 100% over the next four decades, representing a population growth rate five times the national average.

	Glades County	Hendry County	Lee County	Martin County	Palm Beach County	Okeechobee County
Agricultural	33%	52%	12%	40%	45%	47%
Wetlands	21%	28%	14%	41%	31%	9%
Forest Upland	17%	9%	14%	6%	3%	10%
Rangeland	21%	7%	6%	.4%	1%	18%
Water	7%	2%	35%	.7%	6%	5%
Urban	1%	2%	18%	5%	14%	4%
Barren	.5%	.6%	.5%	.2%	.3%	1%
TOTAL AREA (sq. miles)	763	1,163	803	555	1,993	771

PERCENT LAND USE

Table 4A

Table 4B

Projected Resident Populations for 1987 - 2030 *, by County

County	1980**	1987	1990	1995	2000	2010	2020	2030***
Glades	5,992	6,900	7,000	7,600	7,900	8,700	9,600	10,600
Hendry	18,559	23,900	25,900	29,000	31,800	36,600	40,400	44,600
Lee	205,266	288,000	322,300	374,300	425,900	507,700	561,000	619,900
Martin	64,014	88,600	98,700	113,900	128,700	151,700	167,600	185,200
Okeechobee	20,264	26,200	28,300	32,200	35,300	40,700	45,000	49,800
Palm Beach	573,125	766,100	842,100	959,700	1,074,700	1,260,200	1,392,700	1,685,600

* Data from the University of Florida, College of Business Administration, Bulletin No. 60, July 1985 for medium range growth, except as otherwise noted.

** 1980 Florida Census

*** Ten-year growth period for the previous ten years was held constant to obtain this population.

4-2.2 The populations in Glades, Hendry and Okeechobee have similar characteristics, since these counties are predominately rural and agricultural with small, dispersed resident populations and towns of less than 5,000 people. The median age of the year-round residents is approximately 30 years and the average income is $13.928.* The Indian population on the Seminole reservations comprise less than 1% of these counties' total population.

4-2.3 In contrast, Lee, Martin and Palm Beach counties have large population concentrations along their coastlines. The median age of year-round residents is approximately 40 years and the average median income is $18,295.*

4-2.4 Out-of-state tourists triple the study area's population. The current estimated tourist populations and the projected populations to 1995 are shown in Table 4C. A majority of out-of-state tourists visit the area during the winter season, December through March. The median age of this group is older than that of year-round residents.

Table 4C

Projected Tourist Populations
for 1985, 1990 and 1995, by County *

County	1985	1990	1995
Glades	5,417	6,455	7,495
Hendry	47,740	59,271	68,802
Lee	1,333,253	1,588,717	1,844,181
Martin	314,849	375,166	435,493
Okeechobee	83,684	99,718	115,753
Palm Beach	2,125,288	2,532,514	2,939,740

* Data from the Florida Department of Natural Resources, Division of Recreation and Parks.

4-3 ACCESSIBILITY

4-3.1 The Project is accessible by a network of Interstate, Federal, State and County roads. The St. Lucie Canal and St. Lucie River are crossed by US 1 and the Florida Turnpike near Stuart, County Road 710 at Indiantown and US 98/441 at Port Mayaca. S.R. 76 parallels the south bank of the Canal from Stuart to Port Mayaca. Lake Okeechobee is circumvented by three major roads. US 441 follows the northern and eastern shore from the city of Okeechobee to Belle Glade, and US 27 follows the southern shore from Belle Glade to Moore Haven. S.R. 78 follows the western and northern shore and connects Moore Haven and the City of Okeechobee. The Caloosahatchee River is crossed by Interstate 75, US 41, and SR 31 at Fort Myers, SR 78 at Alva, SR 78A at Denaud, SR 29 at LaBelle, and US 27 at Moore Haven. SR 78 and SR 80 approximately parallel the River on the northern and southern shorelines from Fort Myers to Moore Haven.

4-4 UTILITIES

4-4.1 Electric service to the Corps public use areas along the Okeechobee Waterway and Lake Okeechobee is supplied by three firms: Florida Power and Light Company, the City of Clewiston, and Glades County Electric Co-Op. Electric service is available to nearly all portions of project sites through existing distribution lines. All Corps facilities and hurricane gate structures have existing service.

4-4.2 Water is provided to Corps facilities by one of four sources of supply. Lee County Water Service serves the W. P. Franklin Lock; the City of Clewiston serves the Area Office; Corps-operated water treatment plants are used at Ortona, Moore Haven, Port Mayaca and St. Lucie Locks; and, a drilled well serves the campground at Ortona South. Currently, municipal water service is not readily available to the rest of the project area; however, service is expected to become available as the region develops.

4-4.3 Sanitary waste is processed by two methods at Corps facilities. Ortona and Moore Haven Lock facilities utilize a sewage treatment plant to process waste products. W.P. Franklin, Port Mayaca, and St. Lucie Lock facilities, Clewiston Area Office, the campground at Ortona South and the concession at Moore Haven utilize a septic tank/drain field system. Of the remaining public use areas identified in this report, only five have existing sanitary facilities. Those five areas process waste by either a septic tank/drain field system, a packaged sewage treatment plant, or by pumping to a municipal system. The handling of sanitary wastes is a problem for the project since most areas are subject to flooding or the sites are too close to the water supply.

4-5 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

4-5.1 The time line in Figure 4A illustrates the periods of pre-historic Indian occupation and early European exploration in the project area. A comprehensive archaeological and cultural resources survey of Lake Okeechobee, completed by the Florida Division of Archives, History and Records Management (1975) identified eighteen sites in the area.

4-5.2 Comprehensive surveys of cultural resources on the St. Lucie Canal or Caloosahatchee River do not exist. However, according to the State's Division of Archives, History and Records Management (letter dated October 3, 1985, to the Jacksonville District), four possible areas containing cultural resource material are located on the St. Lucie Canal along its length from Port Mayaca to the St. Lucie Lock within 80 feet of the shoreline. Fourteen sites in the area of the Caloosahatchee River, from Moore Haven to the W.P. Franklin Lock, were recorded in the Florida Master Site File at the Florida Division of Archives, History and Records Management at the time of the preparation of the 1981 Environmental Assessment of the Waterway. Of the sites described in the Environmental Assessment, most are located well outside project lands and detailed information about them is not complete.**

4-5.3 Sites identified in the 1975 survey on Lake Okeechobee (see section 4-5.1) are primarily attributed to pre-historic Indians and occured on marginal islands within the Lake, on upstream sites along lake tributaries and landward of the levee along the old lake meander. The pre-historic sites on Lake Okeechobee are predominantly situated on the edges of hammocks and creek and river levees where artifacts have been recovered from middens (refuse) and from sand mounds, constructed to inter the dead, as burial preparation areas, as house sites, and possibly as temple foundations. Other earthworks from this period that are very conspicuous in the area include such forms as large circular ditches and linear and cresent ridges. It is hypothesized that they were constructed to provide artificial, dry fields and terraces for growing maize. Artifacts retrieved from pre-historic sites include tools constructed of bone, lithic tools and marine shell tools. Bone paddle ornaments and wooden paddles associated with burials suggest the possibility that the canoe, a major component of the wetlands culture, was symbolically significant to the culture as well.***

**From: "An Environmental Assessment Related to the Construction, Use and Maintenance of the Okeechobee Waterway, Florida, 1981." U.S. Army Corps of Engineers, Jacksonville District.

***From: "Archaeological Perspectives on Prehistoric Environment in the Okeechobee Basin Savannah" by W.H. Sears.

4-5.4 Although historic contact occurred as early as 1551 with the first Spanish explorers, the history of immigrant cultures does not become siginificant again until the arrival of the Seminole Indians in the beginning of the nineteenth century. The Seminole Indians were pushed into central and south Florida by white settlers and soldiers. Continuing pressure for their removal from Florida resulted in the Second Seminole War, a series of skirmishes, raids and battles from 1835 to 1845 and led to the construction of military roads and forts in the largely unexplored Florida interior. Some battlefield and fort sites have been identified from this period, including the Okeechobee Battlefield, which is a National Historic Landmark located near the town of Okeechobee, and outside of project boundaries.

4-5.5 Knowledge of the Florida interior resulting from the Seminole Wars and from the travels of later Everglades explorers and hunters opened the area to settlement. By the turn of the nineteenth century catfish fishermen and farmers had settled the entire Lake perimeter. Pressure to drain swamp land to create farmland and navigable waterways drastically changed the region. Historical sites from this era include early flood control structures and navigation locks, as well as the early settlements, built in the latter nineteenth and early twentieth centuries. The Everglades Reclamation State Historic Site is comprised of the old Miami Lock Keeper's House on the Miami Canal and has been recognized as a valuable example of man's attempt to manage the area for agriculture.

Figure 4A

400 B.C. Earliest known Indian occupation in the region.

Evidence has been recovered of a subsistence culture based on the exploitation of wild food resources. The canoe was a vital component of the wetland environment. Extensive ceramic works have been recovered.

1551 A.D. Earliest historical documentation of the Lake Okeechobee area was reported by Fonteneda, a Spaniard held captive by Florida Indians from 1551 to 1556. (He reported that the "Caloosas" dominated all of South Florida including the area of "Lake Mayaimi".)

1556 Pedro Menendez de Aviles explored the region in search for a passage between the Atlantic Ocean and the Gulf of Mexico.

mid 1700's Indian communities were disintegrating from socio-economic consequences of Spanich contact. ~~Deaths and migration~~ to the Spanish fishing rancheros on the coast took considerable toll on the native population.

1763 George Bowen, an English geographer, erroneously illustrated South Florida as an archipelago of large and small islands.

1763 British occupation began. Little exploration or settlement occurred.

early 1800's Arrival of Seminole Indians pushed into central and south Florida by white settlers and soldiers.

1821 Florida became part of the U.S.

1835 - 1842 Second Seminole War, a concerted military effort to remove the Seminoles to the Western U.S. resulted in raids skirmishes.

1837 Battle of Lake Okeechobee was fought near Taylor Creek on the north shore of the Lake.

1838 First map of Lake Okeechobee was prepared by military expedition.

1845 Florida was admitted to the Union as a State.

1880 Hamilton Disston began dredging operations.

Old Lock and Lock Keepers House, Miami Canal

RECREATION DEMAND - SUPPLY - NEEDS ANALYSIS

5-1 INTRODUCTION

5-1.1 This chapter establishes the appropriate levels of project development and management to meet future recreation demand. It begins with an assessment of the project area based on predicting recreation participation to the year 2030. This assessment provides general guidelines for future development. In order to provide additional framework for establishing a recreation future, the chapter includes assessments by other planning agencies relating to the project's resources or to resource-based recreation activities in the project area.

5-2 DEMAND-SUPPLY-NEEDS ASSESSMENT

5-2.1 This demand-supply-needs assessment of future recreation at the project is based on the methodology employed by the Florida Department of Natural Resources in preparing the 1981 Statewide Comprehensive Outdoor Recreation Plan (SCORP). It expands the recreation assessment in the 1981 SCORP by assuming a 40- to 50-year planning period, and applies to a smaller geographic area than the SCORP's regional analysis.

5-2.2 In the State's methodology per capita use rates estimate annual resident and tourist recreation participation within a given county. Increases in annual recreation participation is then projected for a future planning year based on anticipated population growth. This methodology calculates increases in participation as a function of increasing population. Once annual participation is established, the demand for recreation facilities on a normal weekend day (when moderate levels of use are expected) can be derived. Future facility needs are then determined by subtracting the existing recreation facility supply from what is required to meet the projected demand.

5-2.3 The recreation market area is the six Florida counties where the project is located. It includes nearly all Florida residents living within a 25-mile driving radius from Lake Okeechobee where the recreation facilities are concentrated, as shown in Figure 5A. The majority of project users are expected to come from within a 25-mile driving distance because the project's facilities mostly provide for day-use activities. A major portion of the populations in Lee, Martin, and Palm Beach Counties live within a 50-mile driving distance from the Lake's resources and the rest within a 75-mile driving distance.

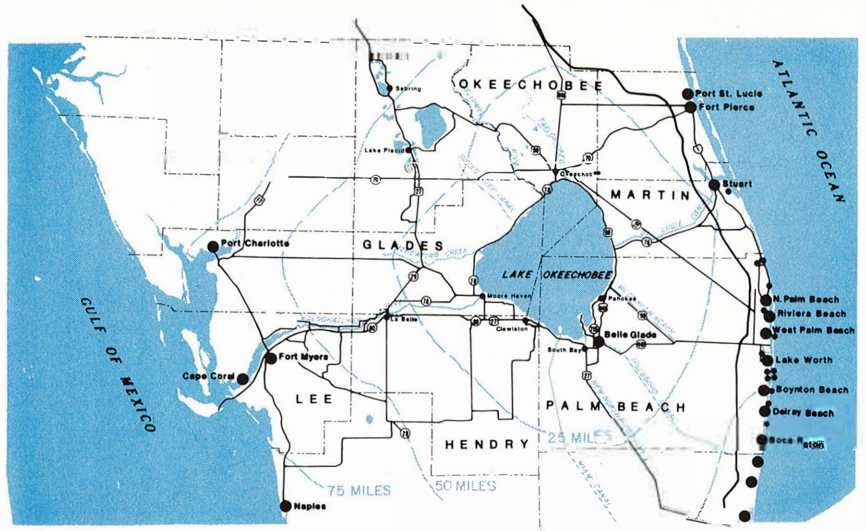


Figure 5A

5-2.4 Competing recreation facilities in the market area are typically located near the coasts where population is concentrated. On both the east and west coasts, saltwater-oriented and urban facilities provide recreation opportunities for both residents and tourists, and visitation to these far exceeds visitation to other regional facilities. Recreation areas that compete with the project's facilities for visitation are shown in Figure 5B. They include several wildlife management areas, State parks and recreation areas, a National park and several aquatic preserves. Many of these areas accommodate activities such as camping, picnicking, hiking, birdwatching, canoeing, etc. Private campgrounds, although not fully inventoried in Figure 5B, are numerous and will continue to develop. The majority are located in communities near the coasts. Others are located near the State wildlife management areas and close to Lake Okeechobee. These campgrounds primarily provide seasonal rèsidence for tourists during the winter months.

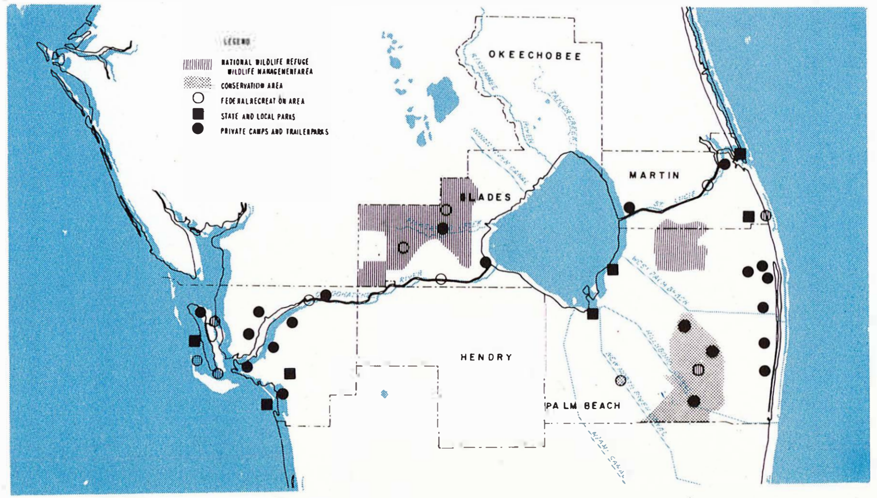


Figure 5B see addendum

5-2.5 SCORP per capita participation rates (PCPR's) estimate annual recreation participation by county residents and tourists. They represent the average number of times an individual participates in a particular recreation activity within a specific county. These PCPR's are shown in Table 5A for typical activities occurring on the project.

5-2.6 Annual resident and tourist recreation participation is calculated by multiplying resident and tourist populations by the PCPR's. Additional participation by Florida residents who live in other counties (non-residents) is accounted for by multiplying the resident participation by the percentages shown in Table 5B.

5-2.7 From total annual recreation participation by residents, tourists and non-residents, the expected participation on a normal weekend day during the tourist season is obtained using the following assumptions; (a) that recreation use by all Florida residents occurrs 50% of the time on weekend days throughout the year, and (b) that 30% of recreation use by tourists occurs during the 4-month winter season equally on all days of the week. The facilities required to accommodate this daily participation is then assessed based on "Use Guidelines" from the SCORP and Corps of Engineers standards. These guidelines are shown in Table 5C and represent moderate levels of facility use.

5-2.8 Table 5D is a summary of the demand-supply-needs assessment for the market area. The total facilities required in the market area by 2030, the existing supply of both public and private facilities and the shortages anticipated in the future are listed. Apparent recreation needs by 2030 include over 25,000 linear feet of freshwater swimming beach, 34 miles of hiking trails, 47.5 miles of nature trails, 226 miles of bicycle trails, and 7 archeological/historic sites. A surplus of boat launching, camping, and picnicking facilities over the planning period is indicated. This does not preclude, however, the need for future, small and localized recreation areas.

5-2.9 Data from the Corps' Natural Resource Management System (NRMS) indicate that current recreation use is taxing existing facilities for which a surplus was indicated in the preceeding recreation assessment. According to estimates compiled under the NRMS, yearly visitation has steadily increased over the seven-year survey period as shown in Figure 5C. In 1984 over 8,000,000 recreation days occurred. Figure 5D shows the percentages of visitation spent in the most popular recreation activities at the

PER CAPITA PARTICIPATION RATES FOR SELECTED ACTIVITIES*

	Freshwater Fishing		Boat Ramp	Camping					Freshwater	Nature	Visiting Arch/
	By Boat	Bank	Use	RV Trailer	Tent	Picnicking	Hiking	Bicycling	Beach	Study	Hist Sites
Glades County	1.41/-	.68/-	.60/-	-/1.0	.11/-	.30/-	.09/-	1.94/-	.61/-	.19/-	.01/-
Hendry County	.42/-	.71/.15	.37/.06	-/.55	.03/-	.52/.12	-/.06	.98/.12	.44/.42	.28/.09	-/-
Lee County	.17/.01	.07/.02	.11/-	.23/.71	.06/-	.21/.22	.49/.28	2.86/1.04	.08/.02	.13/.44	.05/.26
Martin County	.14/-	.14/.19	.14/.01	.06/.30	.03/.39	.52/.10	.19/.22	2.29/ .81	.13/.01	.29/.08	.21/.19
Okeechobee County	2.42/.25	1.00/.38	1.72/.13	.17/1.0	.16/-	.33/.13	-/-	.72/6.19	1.02/-	.04/.13	.02/-
Palm Beach County	.32/-	.22/.04	.11/.03	.07/.42	.09/-	.63/.19	.24/.17	3.03/ .92	.57/.11	.22/.14	.09/.15

* Shown as resident per capita participation rate/out-of-state tourist per capita participation rate.

Table 5A

ADDITIONAL RECREATION PARTICIPATION
BY FLORIDA RESIDENTS FROM OUTSIDE THE MARKET AREA
(SHOWN AS % OF COUNTY RESIDENT PARTICIPATION)

	Freshwater Fishing		Boat Ramp	Camping					Freshwater	Nature	Visiting Arch/
	By Boat	Bank	Use	RV Trailer	Tent	Picnicking	Hiking	Bicycling	Beach	Study	Hist Sites
Glades County	94%	5%	56%	(225)*	254%	94%	110%	20%	26%	86%	300%
Hendry County	155%	67%	118%	(7,191)*	267%	25%	—	81%	83%	---	---
Lee County	58%	500%	5%	82%	100%	320%	84%	37%	787%	148%	390%
Martin County	17%	4%	---	123%	67%	17%	18%	1%	115%	8%	30%
Okeechobee County	18%	31%	16%	80%	14%	14%	(252)*	48%	—	---	100%
Palm Beach County	70%	27%	123%	138%	55%	85%	11%	16%	13%	8%	236%

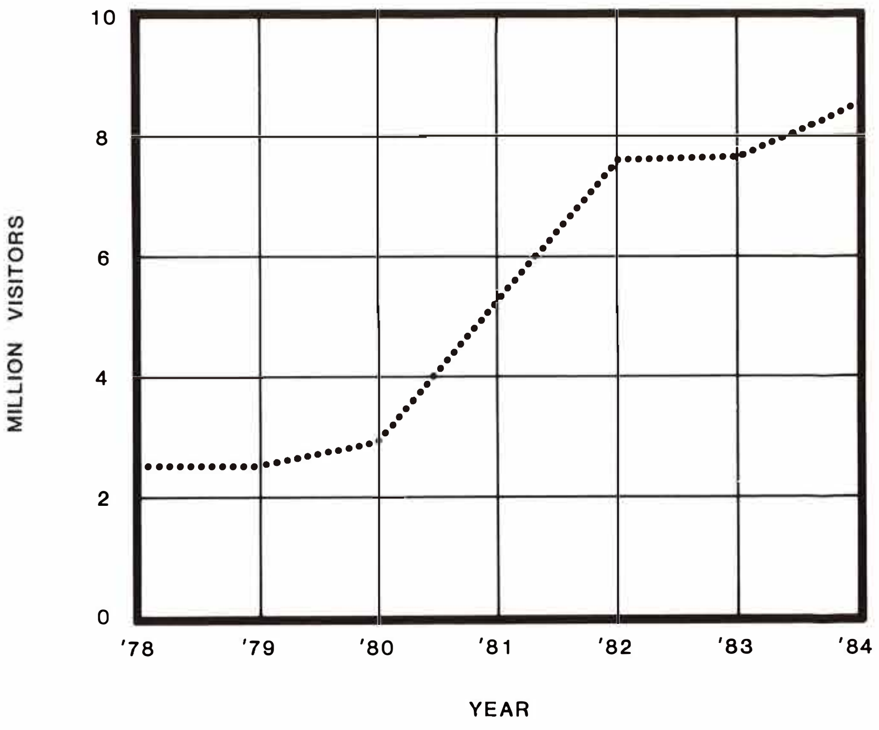
* Since there was no resident participation accounted for in the SCORP survey, use by non-residents is given as an actual count.

Table 5B

project. Currently, these activities are fishing, sightseeing, boating, picnicking, camping, swimming and hunting. The NRMS does not account for other activities that might be expected at the project, such as hiking, since available facilities are limited.

5-2.10 From the NRMS data recreation participation is projected to the planning year 2030, based on predicted population growth. The demand for facilities on a normal weekend day is calculated using the same estimates for weekend participation given in Section 5-2.7 and compared with the existing supply of recreation facilities in order to determine future facility deficiencies. This assessment is shown in Table 5E. In contrast with the conclusions in paragraph 5-2.8, facilities will need to be increased to meet future demand for virtually every activity now occuring at the project.

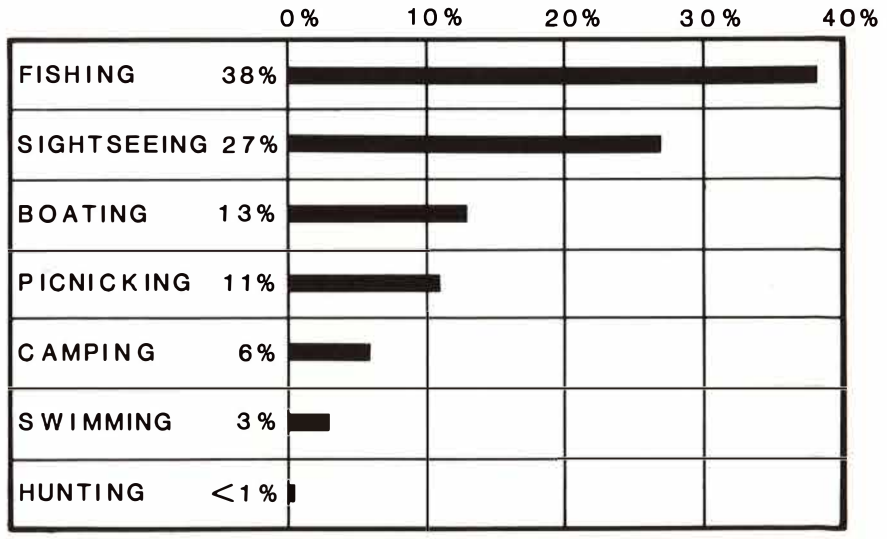
*from NRMS



RECREATION VISITATION *

Figure 5C

PERCENTAGE RECREATION ACTIVITY *



*BASED ON AN AVERAGE YEAR

Figure 5D

RECREATION DEMAND-SUPPLY-NEEDS

USE GUIDELINES

Activity	Facility	Corps Minimum Standards	1981 SCORP Moderate Use Standard
Fishing (non-boat)	Piers, catwalks, Shoreline		6 L.F. shoreline/user/day
Boating	Boat ramps	100 users*/lane/day	160 users/lane/day
Picnicking	Picnic tables	10-15 users/table/day	8 users/table/day
Camping	Campsites	5 users/site/day	4 users/site/day
Swimming (Freshwater)	Beach	25 L.F. shoreline/ 150 users/day	2.5 L.F. shoreline/user/day
Hunting	Acres		21 acres/user/day
Hiking	Hiking trails	One mile per 5,000 visits	125 users/mile/day
Nature Interpretation	Nature trails		250 users/mile/day
Bicycling	Bicycle trails		261 users/mile/day
Visiting Archeological/ Historical Sites	Sites		384 users/site/day

* Based on 2.5 persons per boat, primarily boat fishing.

Table 5C

PROJECTED MARKET AREA DEMAND-SUPPLY NEEDS

Activity	Facilities ** Required to Meet 2030 Market Area Demand*	1985 Market Area Supply Total (Public and Private)	1985 Market Area Supply (Public only)	1985 Project Supply Total (Public and Private)	Additional Supply to Meet 2030 Demand
Freshwater Fishing (non-boat)	26, 412 L.F.	33 Piers & Catwalks	15 Piers & Catwalks	7 Piers & Catwalks (1,550 L.F.)	Cannot be determined
Freshwater Boating	30-(47) lanes	162 lanes	122 lanes	75 lanes	-
Picnicking	(3,971)-4,964 tables	14,264 tables	3,079 tables	323 tables	-
Camping	(8,680)-10,850 sites	20,125 sites	1,717 sites	812 sites	-
Swimming (Freshwater)	(2,333)-33,490 L.F. shoreline	6,336 L.F. shoreline	5,280 L.F. shoreline	430 L.F. shoreline	27,154 L.F. shoreline
Hiking	160-(272) miles	126 miles	107 miles	-	34-(146) miles
Nature Interpretation	81 miles	33 miles	24 miles	3 miles	48 miles
Bicycling	454 miles	228 miles	213 miles	-	226 miles
Visiting Archeological/ Historical Sites	41 sites	34 sites	33 sites	5 sites	7 sites

* On a normal weekend day.

** The range in facilities required reflects both Corps of Engineers Standards and SCORP "Use Guidelines". The Corps standards is shown in parentheses ().

see addendum

Table 5D

PROJECTED NRMS RECREATION DEMAND-SUPPLY-NEEDS

Activity	1984 Project User Occassions (Normal Weekend Day)	2030 Project User Occassions (Normal Weekend Day)	1985 Project Existing Supply	Facilities ** Required to Meet Current Demand	Facilities ** Required to Meet 2030 Demand	Additional Supply to Meet 2030 Demand
Boating	5,180	12,432	75 lanes	32-(52) lanes	78-(124) lanes	3-49 lanes
Sightseeing*	10,657	25,577	-	-		-
Fishing (non-boat)	9,964	23,914	7 piers & catwalks (1,500 L.F.)	59,784 L.F. (includes shoreline)	143,484 L.F. (includes shoreline)	Cannot be determined
Picnicking	4,084	9,802	323 tables	(408)-510 tables	(980)-1,225 tables	(657)-902 tables
Camping	2,762	6,629	812 sites	(552)-691 sites	1,326-1,657 sites	(514)-845 sites
Swimming	1,020	2,448	430 L.F. shoreline	2,550 L.F. shoreline	(408)-6,120 L.F. shoreline	5,690 L.F. shoreline
Hunting	299	718	35,000 acres marsh on Lake Okeechobee	5,382 acres	15,078 acres	-

* Sightseeing occurs at all sites. Five Corps Lock and Dam Sites are open to the public.

** The range in facilities required reflects both Corps of Engineers Standards and SCORP "Use Guidlines". The Corps standard is shown in parentheses ().

Table 5E

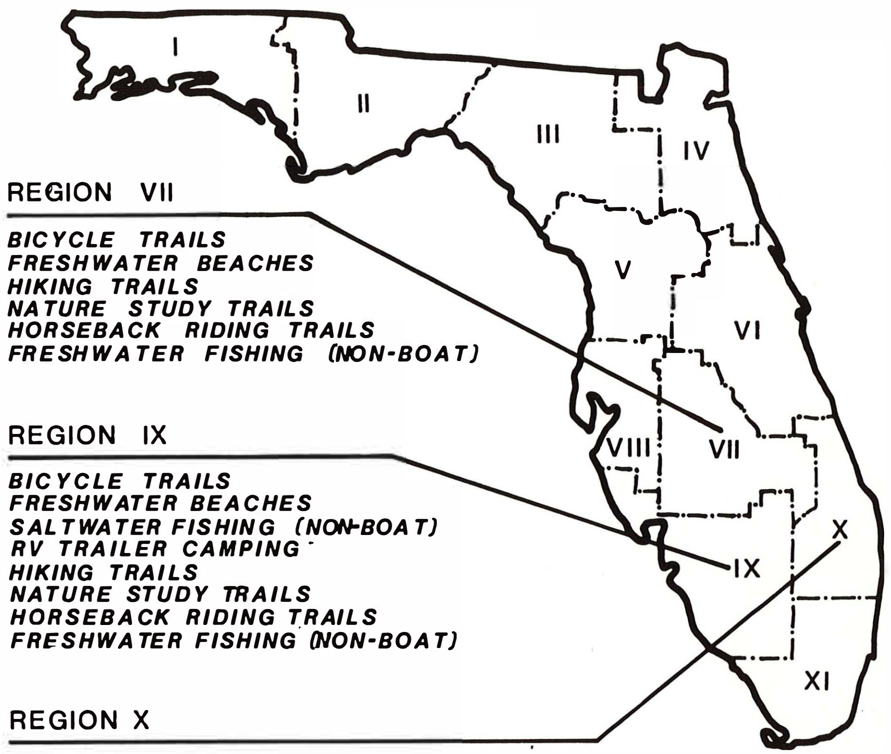
5-3 RECREATION ASSESSMENTS BY OTHERS

5-3.1 Outdoor recreation facilities and activities within the project region have been examined in the 1981 Florida Statewide Comprehensive Outdoor Recreation Plan, (SCORP), and in the market area's county comprehensive plans. The conclusions are summarized for comparison with this study's findings and to establish the recreation assessments and goals of other planning agencies.

5-3.2 1981 Statewide Comprehensive Outdoor Recreation Plan, SCORP. Project resources are located within three of the SCORP's eleven planning regions. Figure 5E lists recreation activities for which facilities will be needed to meet the 1990 recreation demand in these regions. For activities and facilities not listed, such as tent camping, picnicking, and freshwater boat ramp use, the SCORP assumes that current supply of facilities will be sufficient through 1990.

5-3.3 Local Planning Goals. The market area counties' comprehensive plans include goals pertaining to resource-oriented recreation and to specific use of the project's resources. These goals have been included to illustrate the recreation priorities identified at the local level that could be met by management and development measures at the project.

SCORP REGIONAL NEEDS 1981-1990



REGION VII

BICYCLE TRAILS
FRESHWATER BEACHES
HIKING TRAILS
NATURE STUDY TRAILS
HORSEBACK RIDING TRAILS
FRESHWATER FISHING (NON-BOAT)

REGION IX

BICYCLE TRAILS
FRESHWATER BEACHES
SALTWATER FISHING (NON-BOAT)
RV TRAILER CAMPING
HIKING TRAILS
NATURE STUDY TRAILS
HORSEBACK RIDING TRAILS
FRESHWATER FISHING (NON-BOAT)

REGION X

BICYCLE TRAILS
FRESHWATER BEACHES
SALTWATER FISHING (NON-BOAT)
FRESHWATER FISHING (NON-BOAT)

Figure 5E

Glades County, 1981 Comprehensive Plan

Goal:	"Access to the waterways is a problem due to restrictions against public access by government agencies. The county should promote controlled access to these waterways in suitable, publicly-owned areas. Likewise, adequate parking and boat ramps should be made available at existing, congested sites."
Goal:	"A second need is for regional recreation, such as hunting, camping, and similar activities that encompass large areas. Additional opportunities, particularly for hiking trails should be provided where possible in order to provide a greater diversity of activities. The use of the scenic vistas provided by the U.S. Army Corps dikes would provide some of this diversity, particularly for hiking purposes."

Hendry County, 1980 Comprehensive Plan

Goal: "To conserve to the maximum degree practical the recreational resources of Hendry County."

Goal: "To maximize visual and physical accessibility to open space and recreational opportunities for residents of Hendry County."

Martin County, 1982 Comprehensive Plan

Goal: "Encourage development of marinas and boat ramps." Discussion: "The County shall encourage private business to lease and operate marinas at appropriate locations to serve the public. Such areas shall have sufficient land area to accomodate planned marina development and shall direct access to waterways adaptive to marina activity. The County shall be responsible for the development of boat ramps wherever possible in order to make access to the waterways available to the general public."

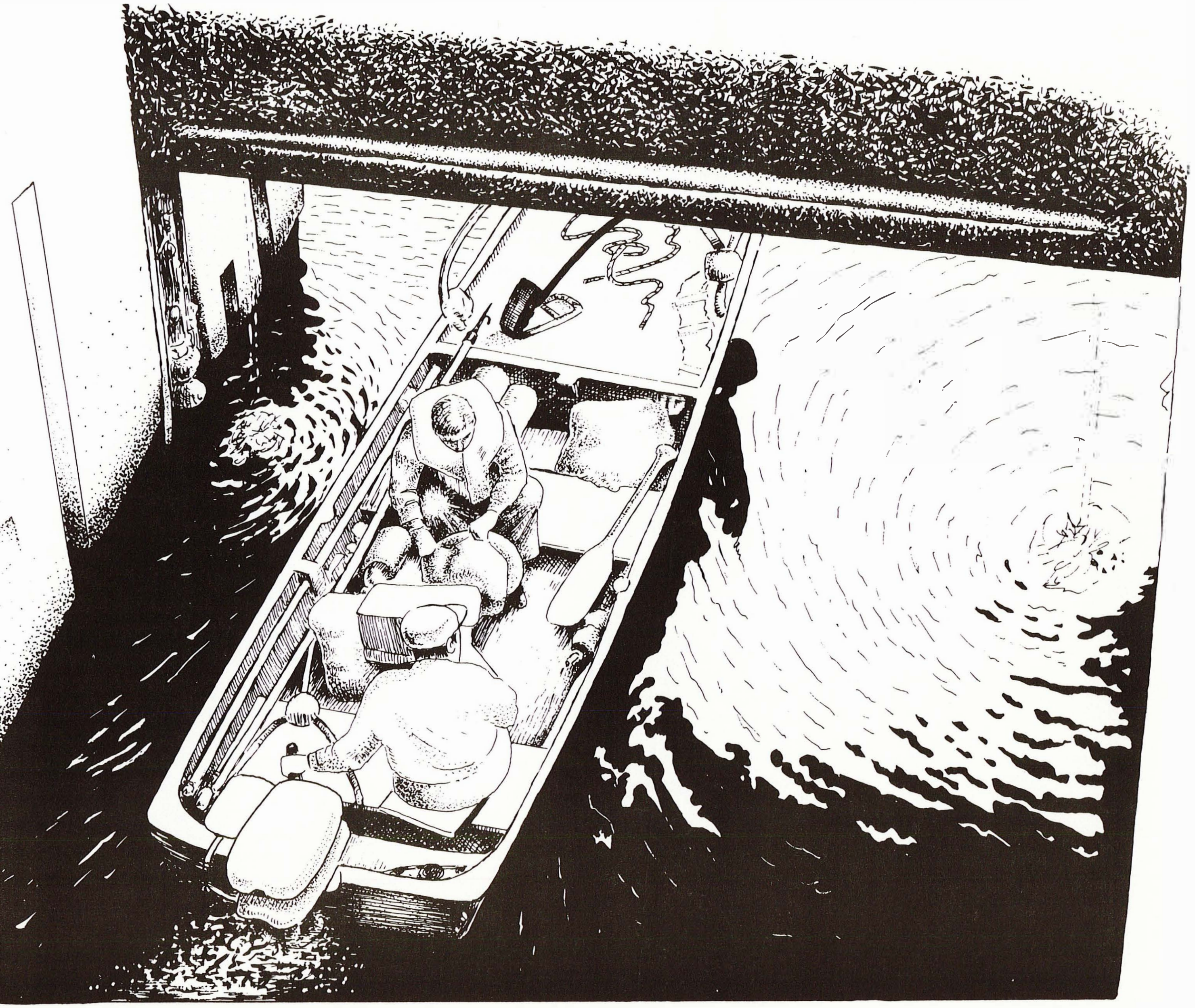
Goal: "Examine the potential for public use of waterfront spoil and maintenance sites." Discussion: "...The South Florida Water Management District owns right-of-way on both sides of Canal C-23 and the St. Lucie Canal and owns two spoil sites in Palm City."

Okeechobee County, 1980 Comprehensive Plan

Goal: "The county should encourage the development of a significant regional recreation area on Lake Okeechobee to promote water-related activities." Discussion: "Lake Okeechobee is the most important natural feature in the area. Its full potential could be realized by the development of a regional recreation center on the north shore. The Eagle Bay area and the small island of Wayside Park provide a natural setting for water sports and activities. The shallow water level of Lake Okeechobee presently restricts swimming, fishing and boating activities on the north shore. By developing a breakwater structure and a dredging program which would increase the water depth, a beach could be created, swimming would be possible and access could be provided to a protected marina in Eagle Bay. A pier projecting of the north shore would also help stimulate the sport fishing activities and the tourists potential. The small island should be preserved in its natural state to provide picnic and other passive recreation activities. These proposals are major items which Okeechobee County could not reasonably afford by itself, but nonetheless the community should actively promote and encourage other counties and the state to help participate in developing Lake Okeechobee to its full potential. The establishment of a regional recreation facility on the Lake would be a significant step towards encouraging responsible growth and development in the future."

Palm Beach County, 1980 Comprehensive Plan

Goal: "To support local, state and regional interests in maintaining the sport and commercial fishing viability in Lake Okeechobee."



Chancey Bay Boat Lock

SUMMARY OF FACTORS INFLUENCING PUBLIC USE DEVELOPMENT

SUMMARY OF FACTORS INFLUENCING PUBLIC USE

6-1 INTRODUCTION

6-1.1 This chapter discusses the existing conditions of the project's recreation resources. It establishes requirements to meet projected demand in the context of existing use patterns, site constraints, resource capacity, operational capabilities and other planning considerations. Recreation deficiencies are indicated by the existing conditions of recreation facilities and the level of participation at those facilities. Overcrowding, unauthorized use of facilities, and excessive vandalism are prime evidence of deficiencies. These are identified in the following discussions based on data from the Corp's NRMS, the Florida Game and Freshwater Fish Commission's creel surveys, campground receipts, and interviews with field staff regarding recreation activities on the project.

6-1.2 There are forty-four recreation areas located on project lands. They are diverse in quality and facilities and are unevenly distributed. Figure 6A summarizes the facilities in all of these recreation areas. Primarily, these areas feature activities such as fishing, boating, camping, and picnicking. Participation varies due to seasonal use, quality of facilities, and the areas' locations relative to population centers. They range in size from less than one acre to two hundred acres. Only eight are developed as multi-use areas; four of these are owned, operated, and maintained by the Corps. These eight together with two large picnic areas on the Lake are the only sites with water supply and sanitary facilities. The remaining recreation areas consist essentially of graded access roads with launching ramps for hunting and fishing access to project waters.

6-2 RECREATION FISHING

6-2.1 Freshwater resources are popular with fishermen, and patterns of current use suggest a deficiency of supporting facilities at several heavily used areas. Estimates of activity in the market area by the year 2030 show over 1,400,000 fishing occasions annually. According to NRMS survey projections, annual fishing occasions on the project may exceed 8,000,000. Per capita participation rates indicate an even distribution of fishing activity between fishing from the bank or by boat. Estimates of future facility requirements include up to 50 additional boat ramp lanes and 27 miles of accessible shoreline, piers or catwalks for bank fishing.

6-2.2 Over 90% of the Project's recreation fishing occurs on Lake Okeechobee. There are two fishing piers on the Lake at the Pahokee State Recreation Area and Okeechobee Park. Bank fishing is also popular on the Lake, especially at the water control structures where turbulent water from controlled releases attracts fish. The areas shown in Figure 6B are most heavily used by bank fishermen. Recreation use at several of these structures was not planned and probably began with the road access developed during construction. Structures on culverts C10A, C14, C13

SUMMARY OF EXISTING FACILITIES - LAKE OKEECHOBEE AND OKEECHOBEE WATERWAY

	TOTAL: OTHER AREAS - 38	TOTAL: CORPS AREAS - 6	RIVER: ALVA ACCESS (1 AC)	RIVER: LA BELLE LIONS CLUB PARK	RIVER: LA BELLE ACCESS (2 AC)	RIVER: LA BELLE CITY DOCK	RIVER: BARRON PARK	RIVER: PORT LA BELLE MARINA *9	RIVER: HICPOCHEE ACCESS NORTH	RIVER: HICPOCHEE ACCESS SOUTH
BOAT RAMPS / LANES	43/60	12/15	1/1	—	1/2	MOORING ONLY	—	1/1	1/1	1/1
PICNIC TABLES *1 / SHELTERS	255/7	68/7	—	10/0	1/0		20/1	5/0	—	—
CAMPSITES / GROUP CAMP AREAS	713/0	99/7	—	—	—		—	—	—	—
SANITARY FACILITIES *2	9 WH 19 WBT	6 WH 1 WBT	—	—	—		WBT	WBT	—	—
BEACH (LF) *3	300	130	—	—	—		—	—	—	—
NATURE TRAILS	2	1	—	—	—		—	—	—	—
PARKING: RAMP / CAR *4	845/1366	142/162	10/5	0/50	12/10		0/30	20/34	6/2	6/2
FISHING PIER: LF	1080	470	—	—	—		—	—	—	—
BOAT SLIPS	829	5^{c}	—	—	—		—	12	—	—

	LAKE: CHANCY BAY (5 AC)	LAKE: HENRY CREEK (2 AC)	LAKE: NUBBIN SLOUGH (40 AC)	LAKE: TAYLOR CREEK (2 AC)	LAKE: OKEECHOBEE PARK (10 AC)	LAKE: OKEE-TANTIE RECREATION AREA (130 AC)	LAKE: BUCKHEAD RIDGE AREA (5±AC)	LAKE: INDIAN PRAIRIE (3 AC)	LAKE: BIG BARE BEACH (10 AC)	LAKE: HARNEY POND (40 AC)	LAKE: LAKEPORT	LAKE: FISHEATING CREEK (5 AC)	LAKE: SPORTSMAN VILLAGE	LAKE: LIBERTY POINT (UNCLE JOE'S) (2 AC) *9
BOAT RAMPS / LANES	2/2	1/1	1/1	2/2	1/2	1/3	1/2	1/1	2/2	4/4	1/1	2/2	1/1	1/1
PICNIC TABLES *1 / SHELTERS	—	—	—	—	10/1	35/0	—	—	—	6/0	—	4/0	—	—
CAMPSITES / GROUP CAMP AREAS	—	—	—	—	—	215/0	50/0	10/1	—	—	45/0	—	—	—
SANITARY FACILITIES *2	—	—	—	—	—	WH WBT	WH WBT	T	—	—	—	—	—	—
BEACH (LF) *3	—	—	—	—	300	—	—	—	—	—	—	—	—	—
NATURE TRAILS	—	—	—	—	—	1	—	—	—	1	—	—	—	—
PARKING: RAMP / CAR *4	15/5	25/25	50/25	25/50	75/75	75/50	20/5	25/25	30/25	100/100	20/5	75/50	10/5	5/10
FISHING PIER: LF	—	—	—	—	80	—	—	—	—	—	—	—	—	—
BOAT SLIPS	—	—	—	—	—	50	*9 142	—	—	—	—	—	—	20

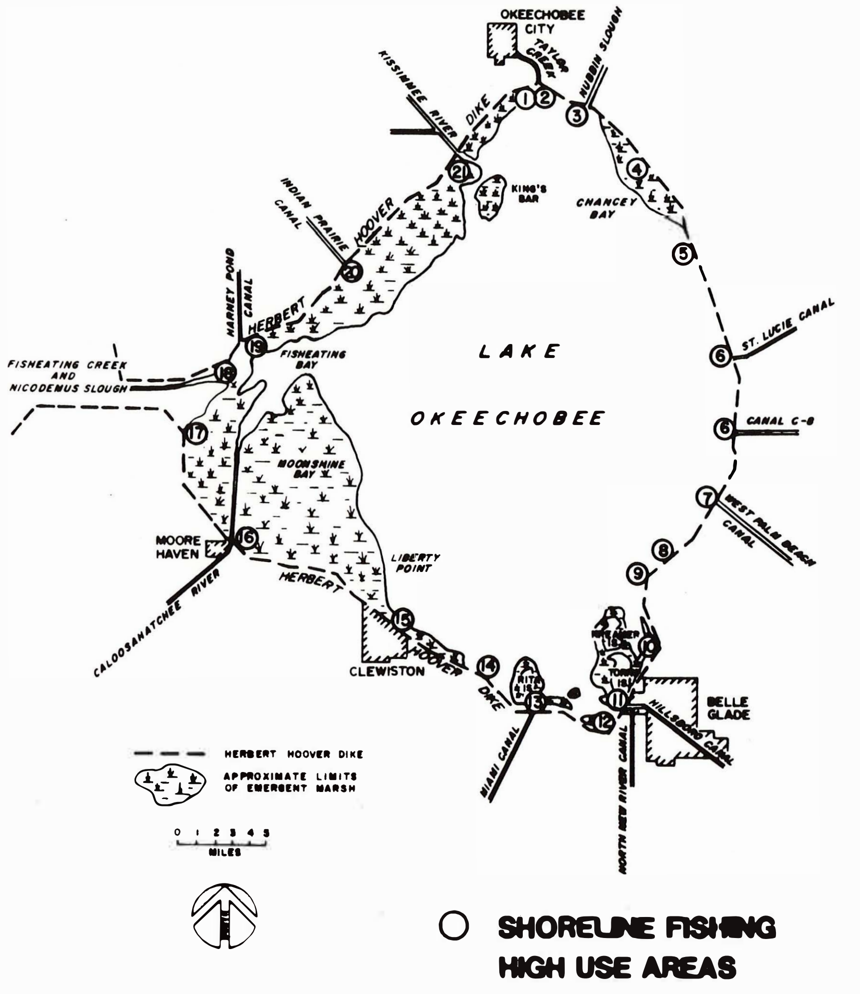
	LAKE: ANGLERS MARINA	LAKE: CLEWISTON MARINA	LAKE: JOLLY ROGER MARINA *8 (1 AC)	LAKE: CLEWISTON PARK (10 AC)	LAKE: OBSERVATION POINT (LITTLE BARE BEACH) (2 AC)	LAKE: JOHN STRETCH PARK (LAKE HARBOR) (111 AC)	LAKE: SOUTH BAY (4 AC)	LAKE: LEVEE ACCESS	LAKE: BELLE GLADE PARK (TORRY IS.) (200 AC)	LAKE: RARDIN PARK (30 AC)	LAKE: BACOM POINT (2 AC)	LAKE: PAHOKEE STATE PARK (30 AC)	LAKE: CANAL POINT (5 AC)
BOAT RAMPS / LANES	1/1	—	1/1	3/8	—	1/1	1/1	—	4/10	1/1	1/1	1/2	1/1
PICNIC TABLES *1 / SHELTERS	—	—	—	17/0	—	40/1	4/0	25/0	21/2	22/1	—	24/0	10/0
CAMPSITES / GROUP CAMP AREAS	40/0	—	—	—	—	—	—	—	247/0	—	—	48/0	—
SANITARY FACILITIES *2	WBT	WBT	WBT	—	—	2WBT	—	—	3 WH 5WBT	2WBT	—	2 WH WBT	—
BEACH (LF) *3	—	—	—	—	—	—	—	—	—	—	—	—	—
NATURE TRAILS	—	—	—	—	—	—	—	—	—	—	—	—	—
PARKING: RAMP / CAR *4	0/20	0/50	10/50	72/25	0/3	5/120	12/6	0/30	100/	5/50	2/4	15/40	20/10
FISHING PIER: LF	—	—	—	—	—	—	—	—	—	—	—	1000	—
BOAT SLIPS	50	55	62	—	—	—	—	—	*9 118	—	—	108	—

	CANAL: DOT ROADSIDE PARK (2 AC)	CANAL: INDIANTOWN MARINA (30 AC) *9	CANAL: PHIPPS PARK (127 AC)	CORPS FEE LAND: CLEWISTON AREA OFFICE (12 AC)	CORPS FEE LAND: W.P. FRANKLIN (57 FEE AC) (6 EASEMENT AC)	CORPS FEE LAND: ORTONA (66 FEE AC)	CORPS FEE LAND: MOORE HAVEN *5 (150 FEE AC) (39 EASEMENT AC)	CORPS FEE LAND: PORT MAYACA (41 FEE AC) (214 EASEMENT AC)	CORPS FEE LAND: ST. LUCIE PARK (155 FEE ACRES)
BOAT RAMPS / LANES	—	1/1	1/1	1/1	2/3	1/1	4^{c}/6^{c}	3/3	1/1
PICNIC TABLES *1 / SHELTERS	6/0	4/0	0/1	—	25/3 *7	25/2	17^{c}/0	—	20/2
CAMPSITES / GROUP CAMP AREAS	—	8/0	60/0	—	29/2	30 *6/2	31^{c}/0	—	9/3
SANITARY FACILITIES *2	—	WH	WH WBT	WBT	2 WH	2 WH	WH^{c}	—	WH
BEACH (LF) *3	—	—	—	—	250	—	—	—	—
NATURE TRAILS	—	—	—	—	—	—	—	—	1
PARKING: RAMP / CAR *4	0/10	10/190	10/20	0/6	30/95	5/15	79^{c}/19^{5c}	10/10	18/80
FISHING PIER: LF	—	—	—	—	100	240	50	—	80
BOAT SLIPS	—	212	—	—	—	—	5^{c}	—	—

Figure 6A

NOTES
- *1. SOME ARE SINGLE TABLES WITH SHELTERS
- *2. WH - WASHHOUSE; WBT - WATER BORNE TOILET
- *3. NO LIFEGUARD
- *4. APPROXIMATE
- *5. PART OF AREA IS OPERTED BY CONCESSIONAIRE (C)
- *6. 10 FREE CAMPSITES
- *7. 2 PICNIC & 1 GROUP ASSEMBLY
- *8. CONCESSION ON CORPS FEE LAND
- *9. PRIVATE INTEREST

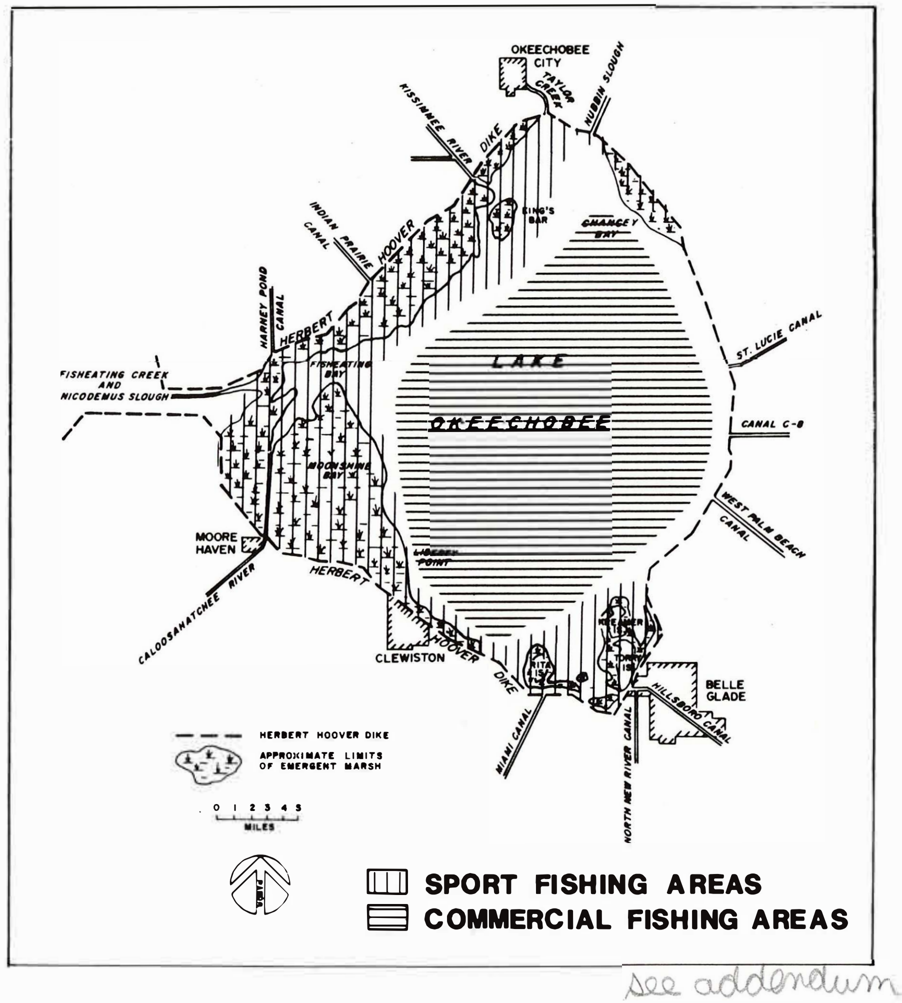
and C9 are frequently used for bank fishing. Fences and gates controlling public access have been vandalized to gain entry onto the structures for better fishing locations. Adequate facilities could provide safe opportunities for fishing.


OKEECHOBEE CITY
TAYLOR CREEK
NUBBIN SLOUGH
KISSIMMEE RIVER
DIKE
KING'S BAR
CHANCEY BAY
INDIAN PRAIRIE CANAL
HOOVER
HARNEY POND CANAL
HERBERT
FISHEATING BAY
LAKE
OKEECHOBEE
ST. LUCIE CANAL
CANAL C-8
FISHEATING CREEK AND NICODEMUS SLOUGH
MOONSHINE BAY
MOORE HAVEN
CALOOSAHATCHEE RIVER
LIBERTY POINT
HERBERT
WEST PALM BEACH CANAL
CLEWISTON
HOOVER
DIKE
MIAMI CANAL
NORTH NEW RIVER CANAL
HILLSBORO CANAL
BELLE GLADE
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5 MILES
○ SHORELINE FISHING HIGH USE AREAS

1 OKEECHOBEE PARK
2 TAYLOR CREEK
3 NUBBIN SLOUGH
4 HENRY CREEK
5 CHANCY BAY
6 C-104
7 CANAL POINT
8 PAHOKEE STATE REC. AREA
9 BACOM POINT
10 RARDIN PARK
11 HGS 4
12 SOUTH BAY
13 JOHN STRETCH PARK
14 OBSERVATION POINT
15 HGS 2
16 MOORE HAVEN
17 FISHEATING CREEK
18 WAYSIDE PARK
19 HARNEY POND
20 INDIAN PRAIRIE
21 KISSIMMEE RIVER ACCESS

Figure 6B

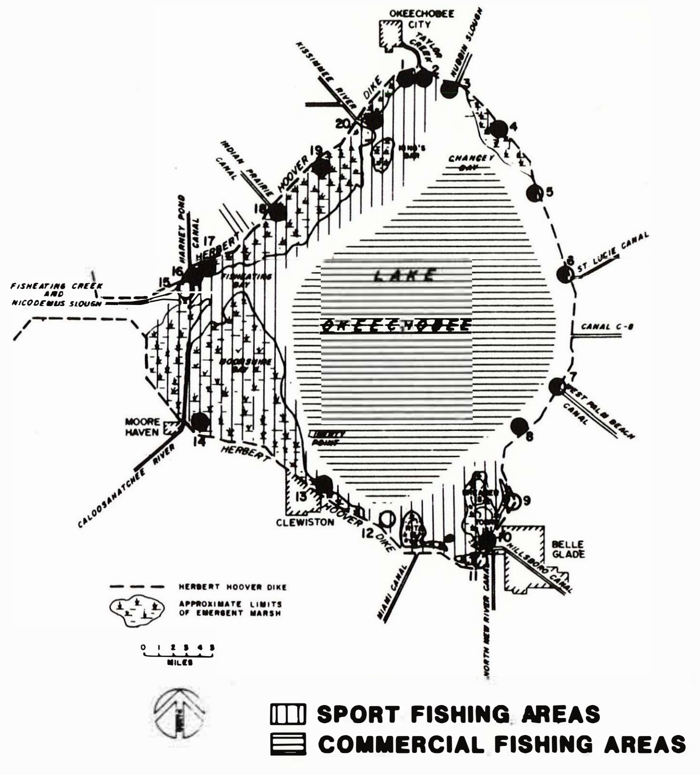
6-2.3 The majority of boating activity on the Lake, is fishing oriented. Figure 6C illustrates the areas on the Lake where fishing by boat is concentrated. Fishing by boat is concentrated in the areas of emergent vegetation, and there is little competition with commercial fishing. The boat launching sites are shown in Figure 6D and the intensity of use at the various launching facilities is noted as either, high, medium or low. This intensity of use is dependent not only on proximity to good fishing areas but on the general condition of facilities and their proximity to population centers. Lockage data in Figure 6E from the small boat locks operated by the SFWMD show that the period of highest boating activity on the Lake occurs during the winter/spring season. This corresponds to increases in fisherman success due to the spawining of crappie and bream and to increases in the numbers of tourists in the area. Year-round boating on the Lake, but at periodically low levels, can be attributed to sport fishing and some hunting by local residents. See addendum


OKEECHOBEE CITY
TAYLOR CREEK
NUBBIN SLOUGH
KISSIMMEE RIVER
DIKE
KING'S BAR
CHANCEY BAY
INDIAN PRAIRIE CANAL
HOOVER
HARNEY POND CANAL
HERBERT
FISHEATING BAY
LAKE
OKEECHOBEE
ST. LUCIE CANAL
CANAL C-8
FISHEATING CREEK AND NICODEMUS SLOUGH
MOONSHINE BAY
MOORE HAVEN
CALOOSAHATCHEE RIVER
LIBERTY POINT
HERBERT
WEST PALM BEACH CANAL
CLEWISTON
HOOVER
DIKE
MIAMI CANAL
NORTH NEW RIVER CANAL
HILLSBORO CANAL
BELLE GLADE
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5 MILES
▥ SPORT FISHING AREAS
☰ COMMERCIAL FISHING AREAS

See addendum

Figure 6C

6-2.4 The fishery resources in the Caloosahatchee River and St. Lucie Canal are not comparable to those of the Lake. The channel bottom of the Waterway in both the Canal and River is not a particularly productive habitat; however, conditions on the River, such as varied riparian vegetation, the open water of Lake Hicpochee and the numerous oxbows, create more favorable conditions for fishery production and fishing than on the Canal. Shoreline fishing typically occurs in and near towns along the Waterway. Piers have been provided for fishing the


OKEECHOBEE CITY
TAYLOR CREEK
NUBBIN SLOUGH
KISSIMMEE RIVER
DIKE
KING'S BAR
CHANCEY BAY
INDIAN PRAIRIE CANAL
HOOVER
HARNEY POND CANAL
HERBERT
FISHEATING BAY
LAKE
OKEECHOBEE
ST. LUCIE CANAL
CANAL C-8
FISHEATING CREEK AND NICODEMUS SLOUGH
MOORE HAVEN
CALOOSAHATCHEE RIVER
LIBERTY POINT
HERBERT
WEST PALM BEACH CANAL
CLEWISTON
HOOVER
MIAMI CANAL
NORTH NEW RIVER CANAL
HILLSBORO CANAL
BELLE GLADE
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5 MILES
▥ SPORT FISHING AREAS
☰ COMMERCIAL FISHING AREAS

BOAT LAUNCHING

● HIGH USE

1 OKEECHOBEE PARK
2 TAYLOR CREEK
3 NUBBIN SLOUGH
4 HENRY CREEK
8 PAHOKEE STATE PARK
10 TORRY ISLAND
14 MOORE HAVEN
13 CLEWISTON
16 HARNEY POND
17 BARE BEACH
18 INDIAN PRAIRIE
19 BUCKHEAD RIDGE
20 OKEE-TANTIE PARK

◐ MEDIUM USE

5 CHANCEY BAY
6 PORT MAYACA
7 CANAL POINT

○ LOW USE

9 RARDIN PARK
10 JOHN STRETCH PARK
11 OBSERVATION POINT

See addendum

Figure 6D

AVERAGE MONTHLY LOCKAGES ON LAKE OKEECHOBEE
(SFWMD LOCKS)

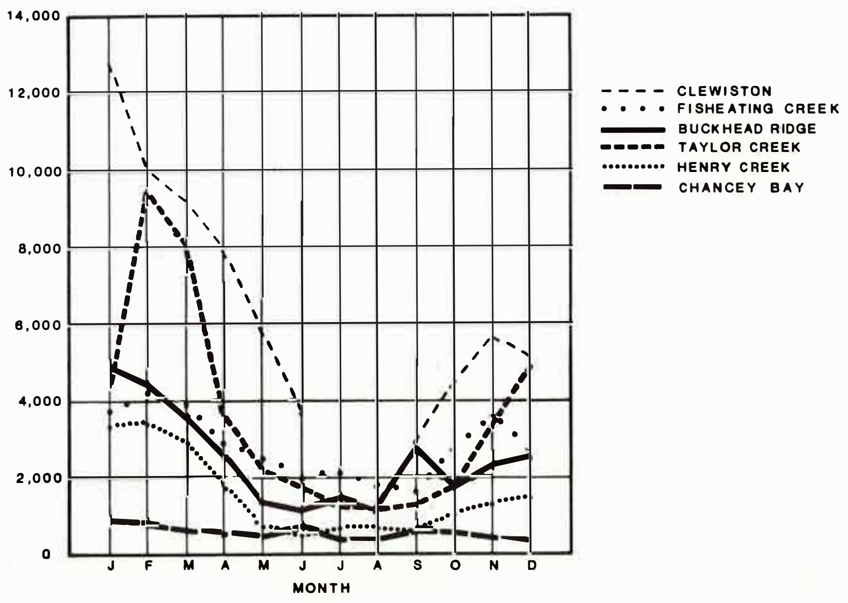


Figure 6E

turbulent water at the Ortona, Moore Haven, and St. Lucie Lock and Dam sites. Fishing is also permitted from the spillway wall at the W.P. Franklin Lock and Dam.

6-3 NAVIGATION AND PLEASURE BOATING

6-3.1 By the year 2030 boating traffic on the Okeechobee Waterway is expected to increase between 250% to 300%. This traffic is comprised of boaters traveling the entire length of the waterway or pleasure boaters. Most of the boating activity through the St. Lucie, Port Mayaca and Ortona Locks is related to navigation. As shown in Figure 6F, the number of craft passing through these locks is nearly identical. Support facilities for overnight mooring and refueling are provided in five locations between the St. Lucie and W.P. Franklin Locks.

AVERAGE MONTHLY LOCKAGES ON THE OKEECHOBEE WATERWAY

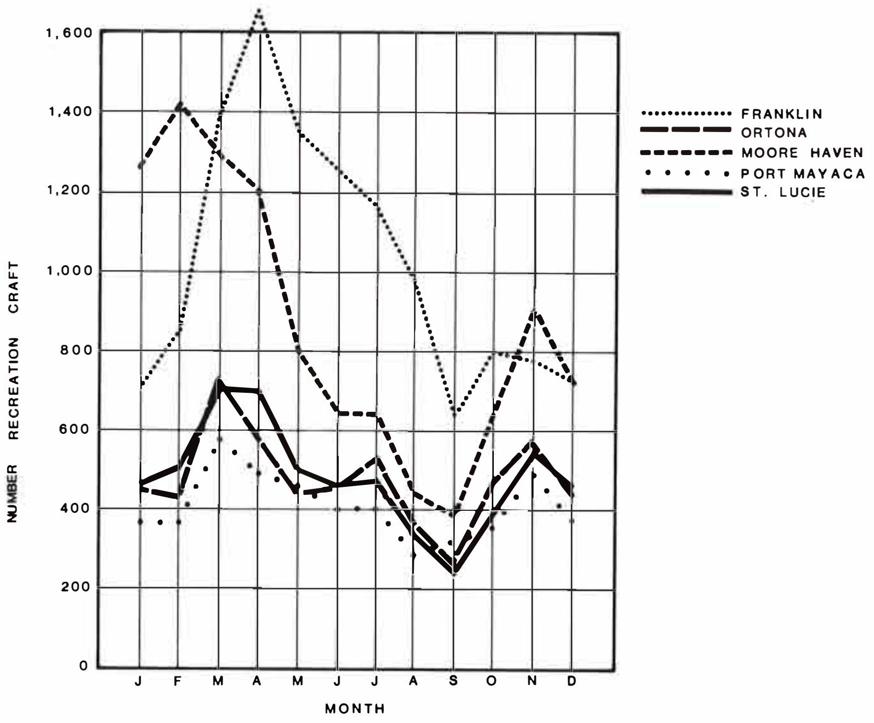


Figure 6F

6-3.2 The pleasure boaters include waterskiiers, sightseers and some fishermen who enter and leave a portion of the system from private docks or from launching facilities. The need for additional ramps, discussed in 6-2.1, can be partially met by developing facilities in areas where pleasure boating pressures are highest. Substantial pleasure boating occurs through the W.P. Franklin Lock in the spring, presumably when residents from Ft. Myers and the developed western end of the River increase their boating activity after the winter. The pleasure boating observed at the Moore Haven Lock corresponds to the winter season with increases in seasonal tourist populations and fishing effort on Lake Okeechobee.

6-4 CAMPING

6-4.1 Data from campground receipts in Figure 6G illustrate the seasonal fluctuation in camping activity at the project. This activity is significantly greater in the winter season when tourists are visiting. Lower levels of camping activity during the rest of the year is attributed mainly to Florida residents. There are about 600 campsites in public campgrounds on the project; however, several hundred additional sites are available at private campgrounds in the area. The most heavily used public campgrounds provide high quality facilities. During the winter season, these campgrounds are filled to near capacity.

CAMPING ACTIVITY

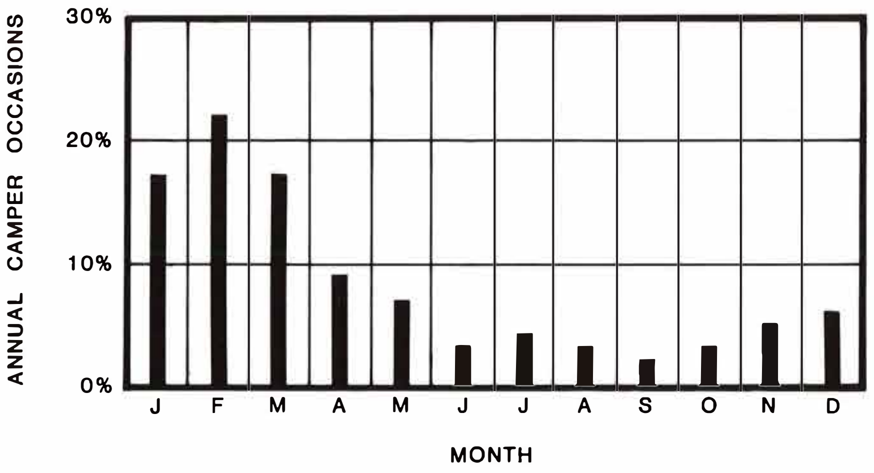


Figure 6G

6-4.2 Although the regional supply may appear sufficient through the planning period, the opportunities for resource-oriented campgrounds on the project are limited and priority should be given to their development. The capacity use of public campgrounds during the tourist season suggests the need for increasing the number of campsites. These public campgrounds fulfill a unique role in the regional camping opportunities because of their orientation to a significant natural resource. Their high quality facilities typically incorporate generous spacing between campsites and restrict permanent or semi-permanent camping arrangements.

6-5 HIKING AND BICYCLING TRAILS

6-5.1 Facilities for hiking are limited on the project. The Corps has a 1.5 mile nature trail located on the north side of the St. Lucie Recreation Area. A brochure is provided for self-guided interpretation, and the trail is heavily used by campers, day-users and various school groups. A segment of the Florida National Scenic Trail, a cross-country hiking trail extending from the Everglades to Blackriver State Park near Pensacola, is located on the dike on the southern and eastern shoreline of Lake Okeechobee, as shown in Figure 6H. On the project it is interrupted along the dike by fences, canals, and water control structures so hikers must leave the dike and walk out to main roads periodically. A preferred trail corridor following the dike on the western and northern shoreline has been identified in the U.S. Forest Service's Comprehensive Plan for the Florida Trail (Draft, 1986). This route passes some of the more scenic areas on the Lake, where the marshes support greater quantities of wildlife. see addendum

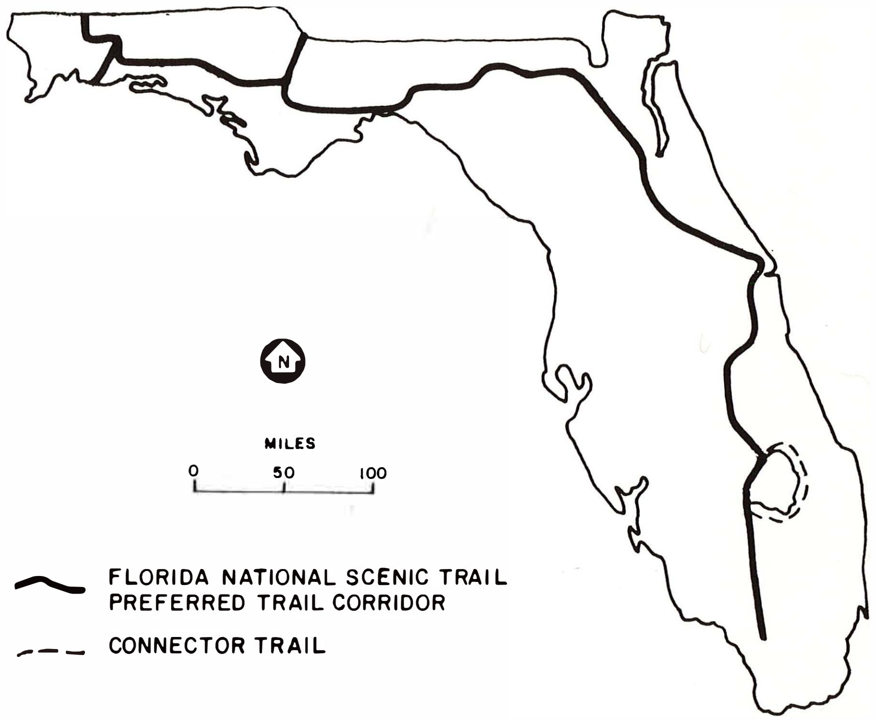


Figure 6H

6-5.2 Trails for bicycling are non-existent. Cyclists use park roads and the public roads adjacent to recreation areas.

6-5.3 The need for hiking and bicycling trails has been established in Chapter 5. The linearity of the dike system surrounding the Lake creates opportunities for extended hiking and bicycling trails. Additions to the Florida Trail located on the dike, such as interpretive features, observation towers, and primitive trail shelters, should be encouraged. Other trail development possibilities include trails for shoreline fishing and nature trails in scenic areas.

6-6 PICNICKING

6-6.1 Picnicking has high levels of participation, and several day-use areas provide attractive facilities. The need for additional facilities is difficult to establish; however, in all areas to be developed or rehabilitated, picnicking should be included as a corollary activity to other recreation pursuits. Picnicking facilities should be available at the smaller access areas for boat launching or shoreline fishing.

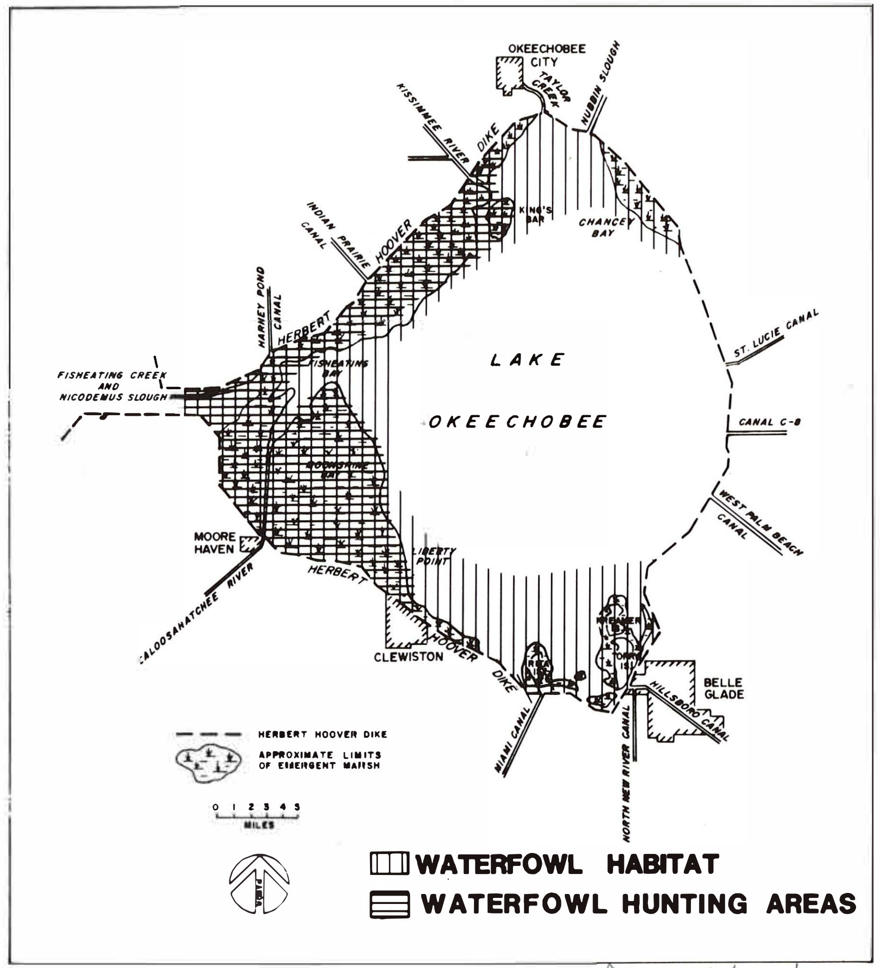
6-7 SWIMMING

6-7.1 Despite the size of the project's freshwater resources, beaches have not been developed. There are two small, unsupervised beaches in Okeechobee Park and the Corp's W.P. Franklin Recreation Area. that are heavily used. Many limitations to beach development exist, such as the potential conflicts between boaters and swimmers, the difficulty in providing supervised swimming opportunities, inhospitable shoreline conditions, and the liability issue. However, a deficiency of freshwater swimming beaches exists and beach development should be encouraged.

Boat Launching at Clewiston Park

6-8 HUNTING

6-8.1 Hunting is limited to waterfowl on Lake Okeechobee as shown in Figure 6I. Crowding at boat launching areas occurs due to combined hunting and fishing use. As discussed under previous sections, additional ramps and/or rehabilitated ramps and parking would alleviate crowding. Although hunting is not permitted on project lands, they may be managed to enhance hunting activity.


OKEECHOBEE CITY
TAYLOR CREEK
NUBBIN SLOUGH
KISSIMMEE RIVER
DIKE
KING'S BAR
CHANCEY BAY
INDIAN PRAIRIE CANAL
HOOVER
HARNEY POND CANAL
HERBERT
FISHEATING BAY
FISHEATING CREEK AND NICODEMUS SLOUGH
LAKE OKEECHOBEE
ST. LUCIE CANAL
CANAL C-8
WEST PALM BEACH CANAL
MOORE HAVEN
HERBERT
LIBERTY POINT
CALOOSAHATCHEE RIVER
CLEWISTON
HOOVER
DIKE
MIAMI CANAL
NORTH NEW RIVER CANAL
HILLSBORO CANAL
BELLE GLADE
HERBERT HOOVER DIKE
APPROXIMATE LIMITS OF EMERGENT MARSH
0 1 2 3 4 5
MILES
▥ WATERFOWL HABITAT
☰ WATERFOWL HUNTING AREAS

See addendum

Figure 6 I

6-9 WATER CARRYING CAPACITY

6-9.1 An optimum water carrying capacity is the maximum amount of boating use that the resource can accommodate and still remain protected and provide satisfaction to participants. This concept involves the following:

(1) Physical carrying capacity is the availability of sufficient open water to provide for an optimum boating experience while the shorelines and existing vegetation absorb the boating impact and remain intact.

(2) Social carrying capacity is the level of use that provides an atmosphere of participant satisfaction in view of divergent uses of the resource.

6-9.2 Due to the size of Lake Okeechobee, it was determined that the optimum water carrying capacity would not be reached and therefore need not be examined in this report. The boating capacities for the St. Lucie Canal and the Caloosahatchee River were determined for their available water surfaces. They are both relatively narrow with limited water surfaces and several existing access points. Visitation, residential development and requests for private structures and shoreline modifications are increasing. Their capacities were based on combining optimum boating densities for several boating activities as presented in Optimum Recreation Carrying Capacity, prepared in 1977 for the Bureau of Outdoor Recreation and the 1981 Florida SCORP. These boating densities represent a conservative estimate of optimum boating conditions.

6-9.3 The St. Lucie Canal has about 440 acres of water surface between St. Lucie Lock and Port Mayaca Lock. The canal is 15.5 miles in length and 230 feet wide. It is assumed that a minimum of 600 linear feet from bow to bow is needed for crafts to operate safely in one direction. This permits vessels traveling in opposite directions to pass. This distance on the Canal is equivalent to approximately three acres of water surface as shown in Figure 6J. Since the Canal's average width is relatively narrow, it is assumed that general boating, limited boat fishing, and navigation would be compatible within the same acreage. General boating is estimated at one boat per 5 acres and fishing at 1.5 boats per acre. The turnover rate for general boating is 3 per day, fishing is 2 per day and navigation is based on a speed of 7 miles per hour. This represents an optimum of 3,564 boats per 15-hour day on the St. Lucie Canal.

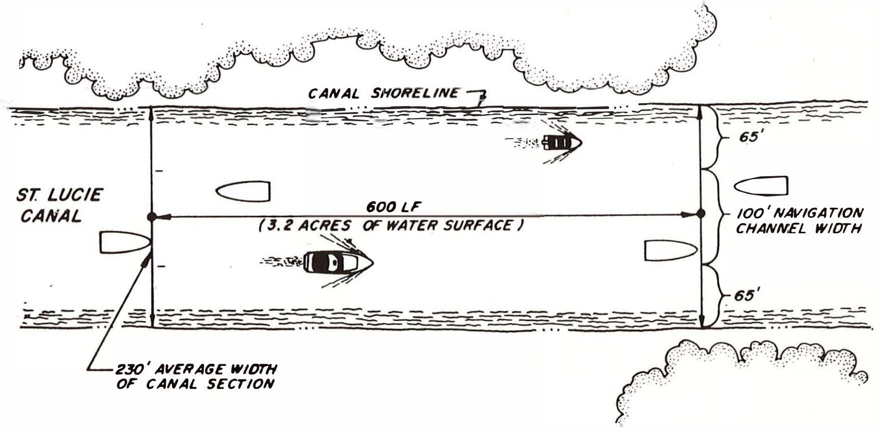

CANAL SHORELINE
65'
ST. LUCIE CANAL
600 LF
(3.2 ACRES OF WATER SURFACE)
100' NAVIGATION CHANNEL WIDTH
65'
230' AVERAGE WIDTH OF CANAL SECTION

Figure 6J

6-9.4 Current use along the St. Lucie Canal is limited due to the lack of facilities. Under todays level of development the St. Lucie Canal is receiving approximately 12% of the optimum carrying capacity. Based on proposed development plans and increasing private development, the canal system could experience up to 3,238 crafts on a peak weekend day or about 91% of the optimum carrying capacity.

6-9.5 The area between Moore Haven and W.P. Franklin Locks on the Caloosahatchee River has about 1,950 acres of water surface. It is 43.4 miles in length, has a navigation channel 90 feet wide, and has three lock structures to aid navigation. The River's overall width is greater than the St. Lucie Canal so the safe navigation distance was reduced to 500 linear feet from bow to bow. The water surface area for the River between transient craft is equivalent to approximately four acres, see Figure 6K. This area will support navigation, boat fishing, general boating and limited water skiing opportunities. The following boating densities are applicable: 1.5 boats per acre for fishing, one boat per 5 acres for general boating and 10 acres per skier per boat. The turnover rate for navigation is based on 7 miles per hour, fishing is 2 per day, general boating is 3 per day, and skiing is 1.5 per day. The optimum number of boats on the Caloosahatchee River is 9,873 crafts per 15-hour day.

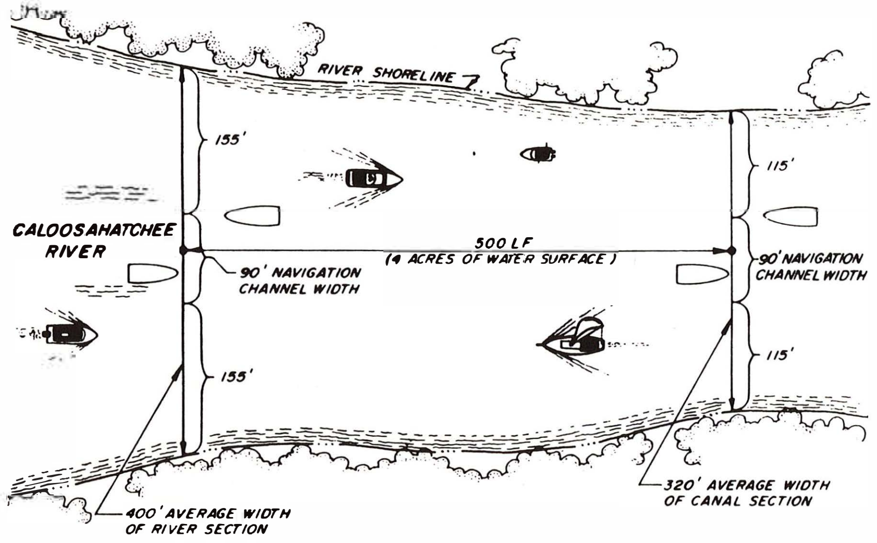
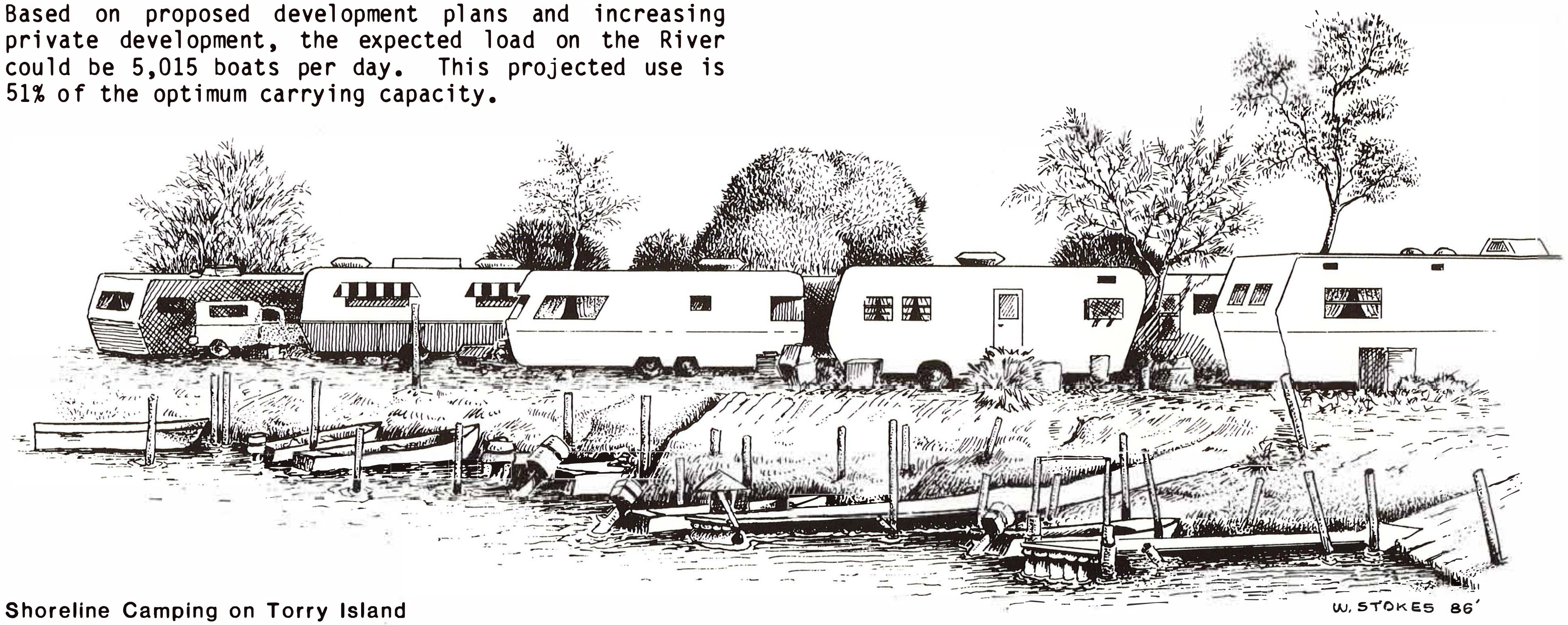
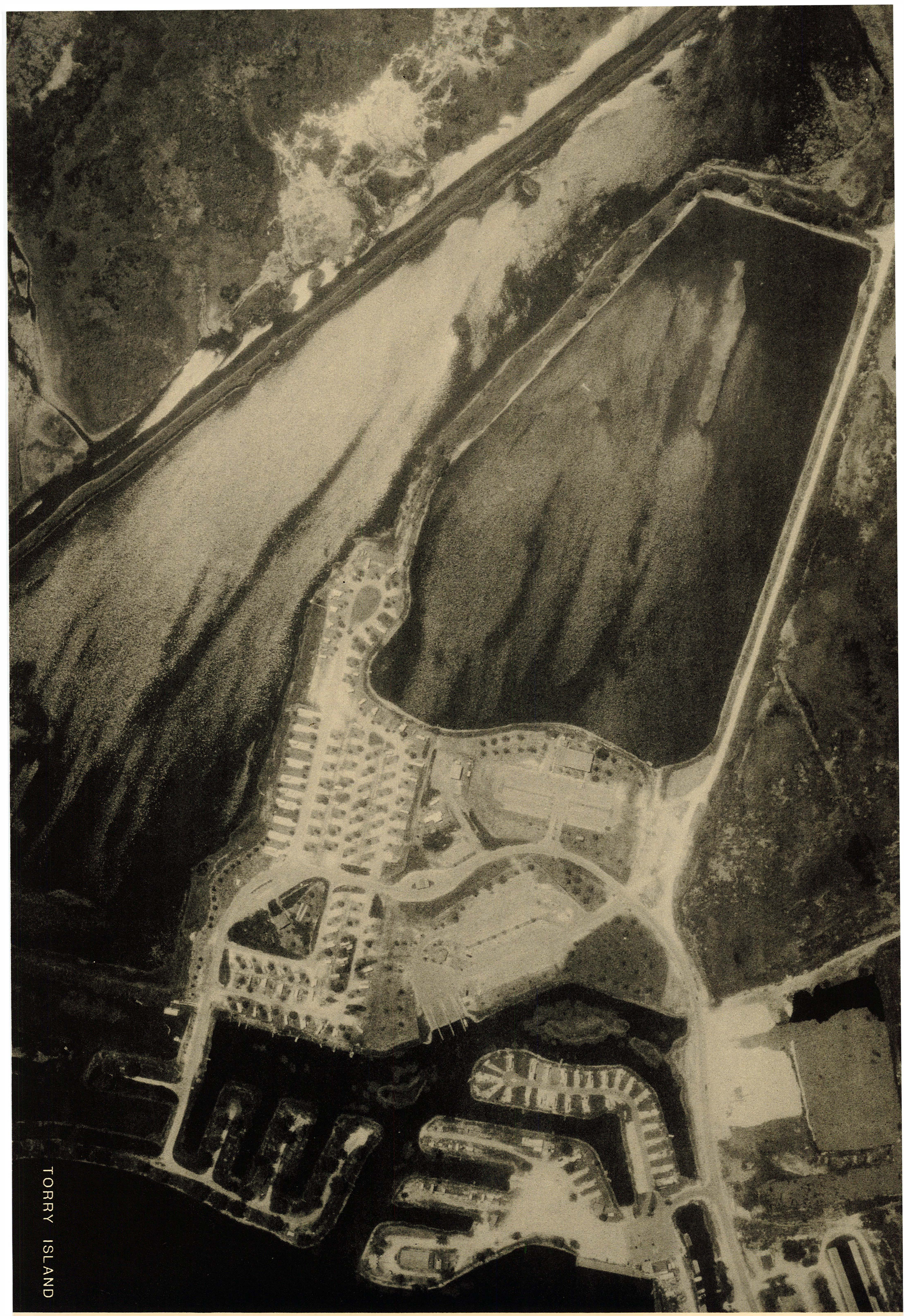

RIVER SHORELINE
155'
115'
CALOOSAHATCHEE RIVER
500 LF
(4 ACRES OF WATER SURFACE)
90' NAVIGATION CHANNEL WIDTH
90' NAVIGATION CHANNEL WIDTH
155'
115'
400' AVERAGE WIDTH OF RIVER SECTION
320' AVERAGE WIDTH OF CANAL SECTION

Figure 6K

6-9.6 Boating on the Caloosahatchee River is generally heavier along the western end due to more extensive residential development, greater river width, and more recreation facilities. Under today's level of development a peak weekend day on the River, between Moore Haven and W.P. Franklin Locks, has about 1,130 boats or 11% of the optimum carrying capacity. Based on proposed development plans and increasing private development, the expected load on the River could be 5,015 boats per day. This projected use is 51% of the optimum carrying capacity.



Shoreline Camping on Torry Island



TORRY ISLAND

PLAN RECOMENDATIONS PART IV

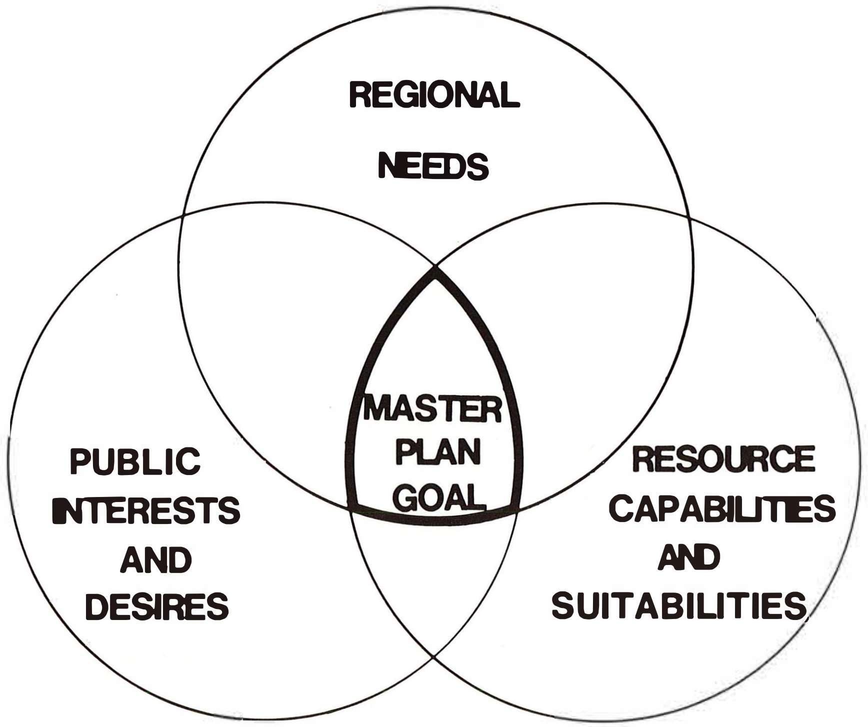
CHAPTER 7

PLANNING PROCESS

PLANNING PROCESS

7-1 INTRODUCTION

7-1.1 The master planning process focuses on three components: (1) resource capabilities and suitabilities, (2) regional recreation demand, and (3) expressed public interests and desires. The first component, the determination of resource capabilities and suitabilities, is based on resource inventories that include a detailed review of existing Federal real estate rights, a field analysis of current recreation use patterns, and aerial photography and mapping of recreation areas. The second component, regional recreation demand, is established by determining the pressures of future visitation on the current supply of recreation facilities and assessing potential future shortages. This assessment is based on the Statewide Comprehensive Outdoor Recreation Plan's data on recreation participation. The third component, public involvement, is essential in establishing information about public use priorities.



7-2 PUBLIC INVOLVEMENT PROGRAM

7-2.1 Public participation was invited throughout the planning process. A technical support group was formed, and newletters were mailed throughout the study area about the master planning. Twelve representatives from resource management agencies established the Land Management Classification Plans. This latter group surveyed the St. Lucie Canal, the Rim Canal and the Caloosahatchee River to assess project lands.

7-2.2 A series of public workshops were held on March 26 through March 28, 1985 in Clewiston, Stuart, LaBelle and Okeechobee. The workshops introduced the master planning to local citizens and encouraged their comments on draft study goals and Land Management Classifications.

7-2.3 Throughout the public involvement program, the following issues were consistently ranked by participants as the most important.

1. Maintain and enhance habitat for fish and other aquatic life.
2. Coordinate the Master Plan with other resources planning and management agencies.
3. Preserve unique and representative ecosystems.
4. Facilitate optimum use of existing recreation sites.
5. Continue public involvement activities to promote awareness of project missions and associated management programs.
6. Maintain and enhance upland wildlife habitat.
7. Protect and enhance threatened and endangered species habitat.
8. Protect and reestablish indigenous shoreline vegetation.

7-2.4 The public identified needs for rehabilitated and new day-use facilities with an emphasis on hiking and biking trails, boat ramps, breakwaters, and docks for boaters, for improved shoreline fishing access, for better signage and information brochures about the project, and for eliminating encroachments. Siltation, bank erosion and water quality were recognized as critical environmental issues.

7-2.5 In addition to those who attended the public workshops or responded to newsletters, the following representatives from other public agencies and private organizations offered information and cited concerns regarding current and future resource use:

U.S.D.A. Forest Service
Southeastern Forest Experiment Station
200 Weaver Boulevard
Asheville, North Carolina 28804

National Park Service
Southeast Regional Office
75 Spring Street Southwest
Russell Federal Building
Atlanta, Georgia 30303

U.S. Fish and Wildlife Service
75 Spring Street Southwest
Russell Federal Building
Atlanta, Georgia 30303

Advisory Council on Historic Preservation
The Old Post Office Building, Suite 809
1100 Pennsylvania Avenue Northwest
Washington D.C. 20004

U.S.D.A. Soil Conservation Service
State Conservationist
401 Southeast 1st Avenue
Gainesville, Florida 32601

U.S.D.A., Soil Conservation Service
Resource Conservationist
Post Office Box 248
LaBelle, Florida 33935

U.S.D.A. Soil Conservation Service
Resource Conservationist
208 South Second Street
Suite B
Fort Pierce, Florida 33450

South Florida Water Management District
Post Office Box V
3301 West Gun Club Road
West Palm Beach, Florida 33402

Park Manager
Okeetantie Recreation Area
Okeechobee, Florida 33478

State of Florida, Department of Natural Resources
Division of Parks and Recreation
Division of State Lands
Division of Law Enforcement, Marine Patrol
3900 Commonwealth Boulevard
Tallahassee, Florida 32308

DNR, Florida Park Service
District Biologist
Post Office Box 398
Osprey, Florida 33559

DNR, Pahokee State Recreation Area
Park Manager
Post Office Box 719
Pahokee, Florida 33476

Florida Game and Fresh Water Fish Commission
620 South Meridan Road
Bryant Building
Tallahassee, Florida 32301

Florida Game and Fresh Water Fish Commission
Lake Okeechobee Fisheries Office
3991 Southeast 27th Court
Okeechobee, Florida 33474

State of Florida, Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

DER, South Florida District Office
2269 Bay Street
Fort Myers, Florida 33901

DER, South Florida District Branch Office
7451 Golf Course Boulevard
Punta Gorda, Florida 33950

State of Florida, Department of Transportation
605 Suwanee Street
Burns Building, MS 57
Tallahassee, Florida 32301

State of Florida, Department of Agriculture and Consumer Services
3125 Connor Boulevard
Tallahassee, Florida 32301

State of Florida, Department of Agriculture and Consumer Services
Division of Forestry
Route 28, Box 258
Fort Myers, Florida 33905

Martin County Board of Commissioners
50 Kindred Avenue
Stuart, Florida 33494

Mayor of Stuart
Post Office Drawer 599
Stuart, Florida 33494

Martin County Soil and Water Conservation
Post Office Box 1234
Stuart, Florida 33495

Palm Beach County Board of Commissioners
Post Office Box 1989
West Palm Beach, Florida 33402

Palm Beach County Soil and Water Conservation
PBIA
7th Street, Building S-742
West Palm Beach, Florida 33406

Mayor of Lake Worth
7 North Dixie Highway
Lake Worth, Florida 33460

Mayor of Pahokee
171 North Lake Avenue
Pahokee, Florida 33476

Mayor of Belle Glade
110 Southwest Avenue East
Belle Glade, Florida 33430

Mayor of South Bay
335 Southwest Second Avenue
South Bay, Florida 33493

Hendry County Board of Commissioners
LaBelle, Florida 33935

Mayor of Clewiston
City Hall
Post Office Box 698
Clewiston, Florida 33440

Mayor of LaBelle
Post Office Box 398
LaBelle, Florida 33935

Glades County Board of Commissioners
Post Office Box 10
Moore Haven, Florida 33471

Mayor of Moore Haven
Post Office Box 399
Moore Haven, Florida 33471

Okeechobee County Board of Commissioners
304 Northwest Second Street
Room 106, Courthouse
Okeechobee, Florida 33472

Mayor of Okeechobee
55 Southeast Third Avenue
Okeechobee, Florida 33472

Lee County Board of Commissioners
Post Office Box 398
Fort Myers, Florida 33902

Mayor of Fort Myers
Post Office Box 2217
Fort Myers, Florida 33902

Mayor of Cape Coral
Post Office Box 900
Cape Coral, Florida 33910

Lake Okeechobee Advisory Commission
Post Office Box 10
Moore Haven, Florida 33471

Calusa Valley Historical Society
c/o President
73 Martin Street
LaBelle, Florida 33935

Florida Trail Association
Post Office Box 13708
Gainesville, Florida 32601

Lykes Brothers, Incorporated
Post Office Box 66
Palmdale, Florida 33944

U.S. Sugar Corporation
Post Office Box 1207
Clewiston, Florida 33440

LaBelle Bass Club
Route 1, Box 445-D
Alva, Florida 33920

CHAPTER 8

RESOURCE USE OBJECTIVES

RESOURCE USE OBJECTIVIES

8-1 INTRODUCTION

8-1.1 Resource Use Objectives are statements of realistic goals for the use of project resources. They guide the design, development, and management of resources to obtain optimum public benefits while protecting and enhancing environmental quality. Resource Use Objectives are identified by studying regional needs, resource capabilities, and expressed public interests and desires.

√ 8-1.2 Resource Use Objectives are listed below. They have been organized in categories: environmental quality, fish and wildlife, cultural resources, planning and implementation, and recreation. They are also discussed by geographic area. More specific objectives for particular recreation sites are included in the discussions in Chapter 10 of the Conceptual Development Plans. See addendum

8-2 ENVIRONMENTAL QUALITY

8-2.1 Project-Wide Objectives

A. Preserve unique and representative ecosystems.

Discussion: Although the land has been considerably modified for flood control and navigation, there remain many areas with aesthetic and ecological values. Some unique areas have developed as the result of project works, such as the extensive marshes on Lake Okeechobee. Several oxbows and islands are remnants of the pre-channelized Caloosahatchee River. These areas enhance public use and are identified in the Land Management Classification Plans. In order to retain these areas, their protection should be advocated in all Corps activities.

B. Control encroachment on project lands and waters.

Discussion: Encroachment disrupts shoreline vegetation. Encroachment also limits access to project lands for operations and maintenance. Monumentation should be implemented to provide boundary locations for effective monitoring and control of encroachment.

C. Monitor environmental conditions to minimize resource degradation.

Discussion: A continuing, coordinated monitoring effort should be implemented to provide critical information on environmental quality. Shorelines are continually being modified by private and public development. Population growth occurring in counties adjacent to the project will continue to result in development pressures affecting the resource.

D. Protect and reestablish indigenous shoreline vegetation.

Discussion: In areas where native vegetation has been removed or replaced by exotics, wildlife habitat and the visual resources are diminished. Vegetation can also assist in the stabilization of shorelines. A coordinated program with other interested agencies should be developed to promote protection and rehabilitation of indigenous shoreline vegetation.

*E. Consider environmental quality in the design or rennovating of facilities.

8-2.2 Lake Objectives

A. Test alternative turf plantings on the lake levee.

Discussion: Only turf is permitted on the lake levee to maintain the levee's structural integrity, and a limited variety of herbaceous species are installed during revegetation activities. A diverse cover could be tested to determine effectiveness of producing food and cover for wildlife, reducing mowing and enhancing visual quality.

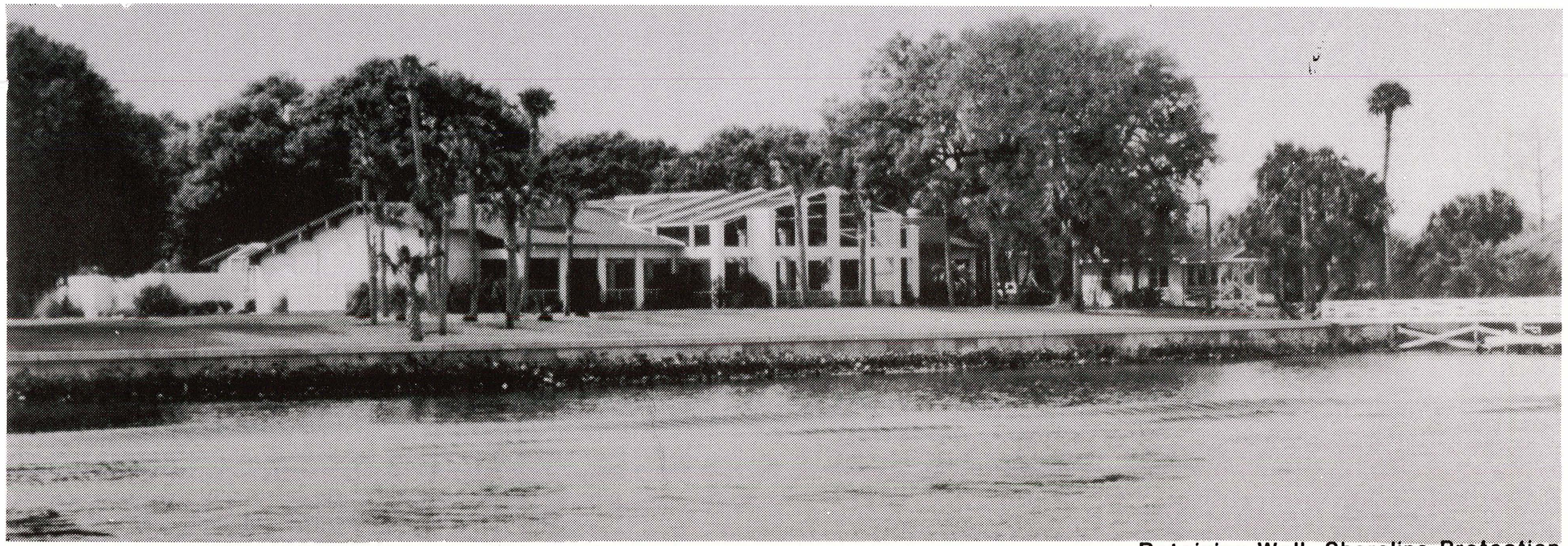
B. Replace exotic tree species with native species in all recreation areas during construction or operations and maintenance.

Discussion: Existing trees in many recreation areas are the result of early tree planting programs on the levee. Several problems with these exotic species warrant their removal; however, they have considerable positive benefit in recreation areas in providing shade, visual interest and attracting wildlife. See addendum

8-2.3 River and Canal Objectives

A. Consider adverse aesthetic impacts of increasing development that results in the loss of the natural shoreline.

Discussion: In many areas private landowners are requesting dock permits, permits to construct canals, basins and other shoreline modifications. Additional emphasis should be placed on the aesthetic, fish and wildlife, and recreation values during review of applications. The Corps' Lakeshore Management Plan should incorporate a specific strategy to protect these resources. Public participation should be utilized in establishing effective criteria which could be enforced through Lakeshore Management, local zoning ordinances and/or permitting procedures administered by the Corps and DER.



Retaining Wall, Shoreline Protection

B. Study the feasibility of permitting community docks and/or marinas rather than a proliferation of individual docks to reduce and confine the impacts of shoreline development.

Discussion: Many reservoir projects under the Lakeshore Managament Plan have accomplished protection of shorelines by limiting private dock development to specified areas where shoreline aesthetics, habitat values, and boating safety are not compromised. Areas where dock and marina development will have the least negative impact on project resources should be identified.

C. Encourage shoreline modifications that reduce erosion, create littoral zones, incorporate indigenous plant species and enhance aesthetic values along the Canal and River.

Discussion: The development of waterfront property is placing increasing pressures on the aesthetic and ecological values of River and Canal shorelines. Development can be compatible with maintaining various resource values. Alternative means of promoting protection of valuable areas should be studied with involved management agencies.

8-3 FISH AND WILDLIFE

8-3.1 Project-Wide Objectives

A. Maintain and enhance habitat for fish and other aquatic life.

Discussion: Fishing is the most popular recreation activity on the project. A sizable commercial fishery also occurs on the Lake. These fishing opportunities depend on the continuation and enhancement of high quality habitat. Coordinated efforts with the Florida Game and Fresh Water Fish Commission should be continued.

B. Maintain and enhance wildlife habitat.

Discussion: Project shorelines provide vegetation important to wildlife. Alternative management strategies should be investigated to maintain and enhance existing wildlife habitat. Coordinated efforts with the Florida Game and Fresh Water Fish Commission should be continued.

C. Protect and enhance threatened and endangered species' habitat.

Discussion: Endangered species' habitats are cooperatively monitored by State and Federal agencies. All activities on project lands should be planned to minimize adverse impacts.

8-3.2 Lake Objectives

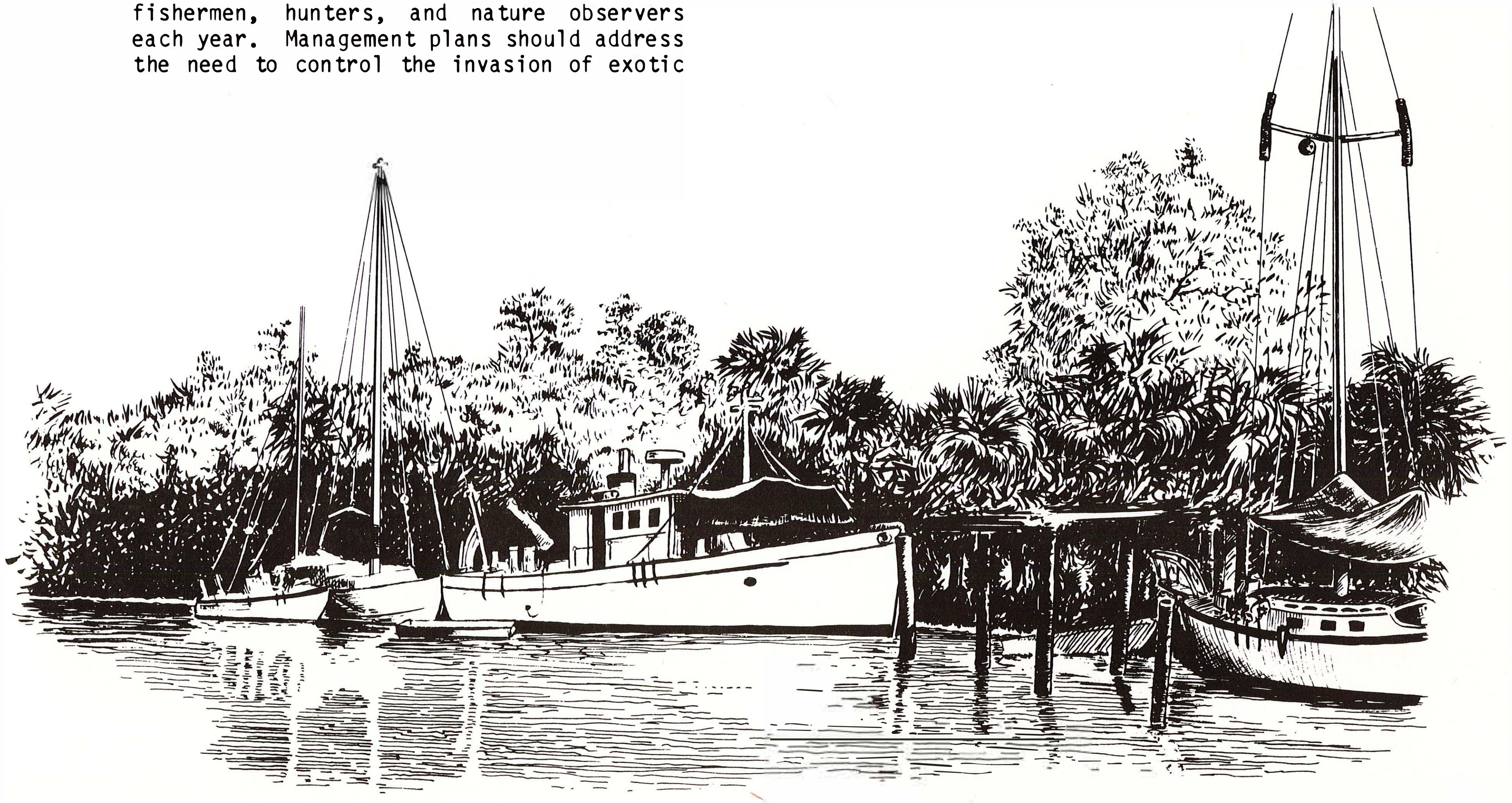
A. Coordinate with other resource management agencies for monitoring and maintaining the productive marsh vegetation in Lake Okeechobee.

Discussion: The emergent marsh in Lake Okeechobee has become a productive ecosystem supporting fish and wildlife populations that draw thousands of fishermen, hunters, and nature observers each year. Management plans should address the need to control the invasion of exotic plant species, the effect of herbicide applications on non-target populations, and the long-range impacts of water-level management plans. Potential enhancement programs, such as controlled burning and monitoring programs, should also be considered to assist in marsh protection.

8-3.3 River Objectives

A. Coordinate an oxbow management plan to assure the water exchange within the oxbow system.

Discussion: The remaining oxbows on the Caloosahatchee River provide recreation opportunities for boaters and fish habitat. A management plan should be developed to assure water exchange within the oxbow systems to improve water quality.



Private Docking Facilities on an Oxbow, Caloosahatchee River

8-4 CULTURAL RESOURCES

8-4.1 Project-Wide Objectives

A. Evaluate archeological/historic resources that may be affected by development.

Discussion: There are several known archeological/historic sites within the project area. Prior to development the potential impacts on cultural resources would be examined according to the National Historic Preservation Act.

B. Consider use of archeological/historic sites for interpretive activities.

Discussion: The past activities of Indians, settlers, land developers, and the Corps provide a wealth of material for interpretive facilities. Road-side signs, self-interpretive trails, and information kiosks may be used to provide information on the past.

C. Consider use of cultural artifacts in interpretive exhibits.

Discussion: In the rehabilitation and replacement of project facilities, the interpretive value of artifacts should be considered. These may be incorporated into exhibits recounting the Corps' role in the region's development. Artifacts, such as the old cast iron light standards salvaged from the Ortona Lock and Dam, may also have aesthetic value at Corps sites.

8-5 RECREATION

8-5.1 Project-Wide Objectives

A. Encourage optimum use of existing and future recreation sites.

Discussion: Recreation facilities have not been designed and maintained to sustain optimum use. Many parking facilities are inadequate; some concrete ramps have too little slope for launchings; adequate sanitary facilities have not been provided; signage and literature are limited. Rehabilitation should include paving access roads and parking areas to reduce dust pollution and erosion. Ramps should be provided with adequate maneuvering space, parking, courtesy docks, security lighting and sufficient water depths for seasonal use. Cost-effective means of providing sanitary waste disposal should be coordinated with local sponsors. Improved signage and information about project resources should be provided.

B. Provide additional opportunities for shoreline fishing, hiking, bicycling, outdoor education and swimming.

Discussion: The need for more facilities for these activities will increase as market area populations increase. This will further stress existing opportunities already in short supply. Development of these opportunities should be encouraged through available programs.

C. Designate and manage scenic sites.

Discussion: Project resources attract over seven million people each year. The project land and water areas are an essential resource in meeting future public demands for recreation activities. The lake levee provides a visual barrier for many area travelers. Roads adjacent to the River and Canal offer limited vistas and opportunities to obtain direct access to the Waterway. Improved access, signage, information brochures and developed overlook areas would improve access to the project.

D. Provide and encourage landscape improvements in public-use areas.

Discussion: Many recreation areas have inadequate vegetation to provide shade and screening between conflicting use areas. Landscaping contributes to the visual quality of areas. Additional landscape planting should be included in all detailed development plans.

8-5.2 Lake Objectives

A. Encourage future development of recreation opportunities on Lake Okeechobee.

Discussion: Several opportunities for wildlife observation, excellent hiking, biking and shoreline fishing are undeveloped. Development should include wildlife observation towers, boardwalks through the marsh, nature trails, biking trails, and shoreline fishing trails. Areas such as Fisheating Creek, Observation Island, the peninsula on the Kissimmee River's south side, and Eagle Bay, present possibilities for such development. These areas are adjacent to the preferred route of the Florida Trail and their development would complement trail facilities.

8-6 PLANNING AND IMPLEMENTATION

8-6.1 Project-Wide Objectives

A. Coordinate the master plan with other agencies.

Discussion: Project resources are cooperatively managed by several government agencies with different missions and goals. Coordinated planning should be continued to help ensure that these goals are compatible and that management agencies work together for comprehensive management.

B. Continue public involvement activities to promote awareness of project missions and associated management programs.

Discussion: Public information will help prepare area residents and visitors for more informed participation in project planning, use, and participation in future volunteer programs. Workshops, meetings, media announcements, and similar activities should be continued.

C. Encourage a long-term, public-use monitoring program.

Discussion: Information on a large and diverse recreation system should be compiled through a comprehensive data collection and analysis system. The overall objective of the monitoring program would be to provide resource managers and decision makers with the best available information. This will insure the continuation of the project as a viable recreation resource, while maintaining its multiple-use character.

JOLLY ROGER
MARINA
MARINA
AIRBOAT
RIDES

CHAPTER 9

LAND MANAGEMENT CLASSIFICATION PLANS

LAND MANAGEMENT CLASSIFICATION PLANS

9-1 PURPOSE FOR CLASSIFICATION

9-1.1 The Land Management Classification Plans identify the best public use of project lands. Project lands include areas where the Corps has fee title or easement rights to land to operate and maintain the project. The identification of appropriate land uses does not imply Federal plans for land use changes. These classifications are intended to enhance public awareness and provide a framework for future cooperative efforts in resource management.

9-1.2 Classification assignments were influenced by these factors:

- Federal laws and regulations that place priority on flood control and water supply above other project uses.
- The great size and multiple uses of the project area.
- Federal land management practices and arrangements with other government agencies and the using public.
- Limited implementation opportunities for public recreation.
- Limited recreation user data, especially for some remote areas.
- The need for a coordinated **review** and approval of public use activities on project lands by all resource management offices.
- The need for identification of land management criteria for dredged material disposal areas.
- The need for clear planning criteria to facilitate the Lakeshore Management Plan.
- The need for land management criteria involving real estate licenses and regulatory permits.

9-2 CLASSIFICATION DEFINITIONS

9-2.1 The Land Management Classifications defined below were established to classify project lands based on criteria in Corps of Engineers Planning Regulations ER 1120-2-400 and draft ER 1130-2-xxx. The following definitions describe the desirable management function of each classification and some of the activities and uses compatible with the intention of that classification. Classification definitions may be expanded or modified as the project develops. see addendum

🟨 Lands for Project Operation are classified for the safe and efficient operation of the project's authorized purposes. These include lands on which the project's operational structures and facilities are located, such as locks and dams, offices, storage yards and pump stations, etc. Limited public use and access may be permitted.

🟩 Lands for Recreation are classified to support authorized recreational activities by the visiting public. These include lands for concessions and quasi-public development. Recreation lands will support both intensive and low-density recreation. Intensive recreation areas include developed parks, campgrounds, beaches, and marinas. Low-density recreation areas would include hiking and bicycle trails, primitive camping, and fishing access sites.

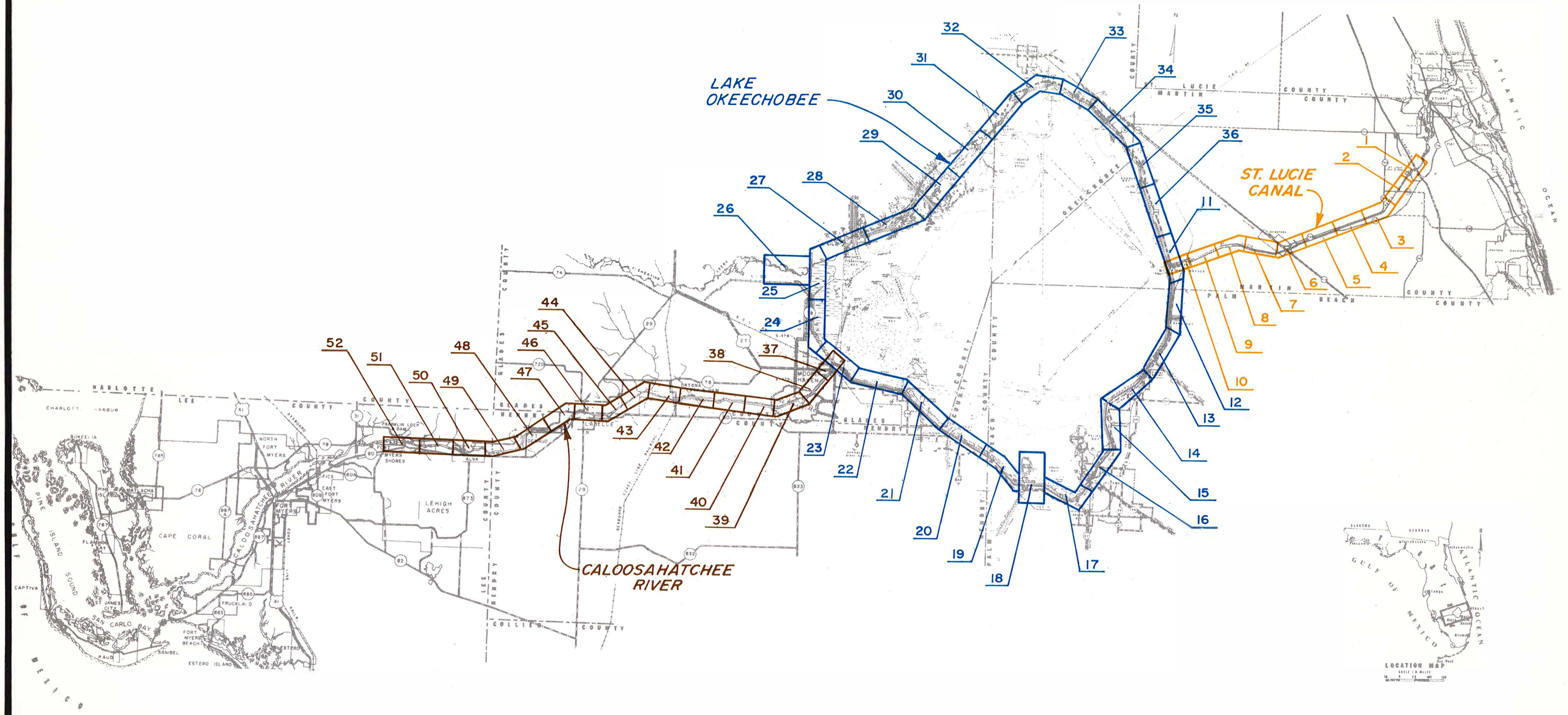
🟫 Lands for Fish and Wildlife Management are classified for the conservation and enhancement of fish and wildlife habitat while permitting some forms of public recreation that have proven to be compatible with this purpose. These lands may provide opportunities for activities such as fishing, bird watching, photography, primitive camping, and canoeing. Fishing and hunting oriented facilities, such as boat landings, trails and access roads, may be constructed within this classification.

⬛ Lands for Natural Areas are classified for the conservation of scientific, ecological, historical, archeological or unique visual features. Lands that are managed to protect threatened and endangered plant and wildlife species are included in this allocation.

🟧 Lands for Waterway Corridor are those involved with the Corps of Engineers operation of the Waterway that are not otherwise allocated for a specific public use. Lands should be managed to preserve the natural vegetation along the shoreline to prevent erosion, retard run-off and to protect the natural scenic values. Protecting the aesthetic quality of shoreline vegetation along the navigation corridor for recreation boating is essential to the public interest.

9-3 LAND MANAGEMENT CLASSIFICATION PLANS

9-3.1 The following 52 plates delineating Land Management Classifications on the project were prepared through coordination with local, State and Federal agencies. They represent a conscientious and systematic effort to match resource capabilities with proposed management activities. Specific attention was given to identifying "Natural" and "Fish and Wildlife Management" areas, because these have not been previously identified in a comprehensive manner as potential land management functions.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ATLANTIC OCEAN
GULF OF MEXICO
CHARLOTTE COUNTY
LEE COUNTY
GLADES COUNTY
HENDRY COUNTY
COLLIER COUNTY
MARTIN COUNTY
ST. LUCIE COUNTY
PALM BEACH COUNTY
OKEECHOBEE
CAPE CORAL
LEHIGH ACRES
NORTH FORT MYERS
FORT MYERS
PINE ISLAND SOUND
SAN CARLOS BAY
CAPTIVA
SANIBEL
ESTERO ISLAND
FORT MYERS BEACH
ALVA
LABELLE
MOORE HAVEN
LOCATION MAP

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

INDEX TO PLATES

SCALE IN MILES
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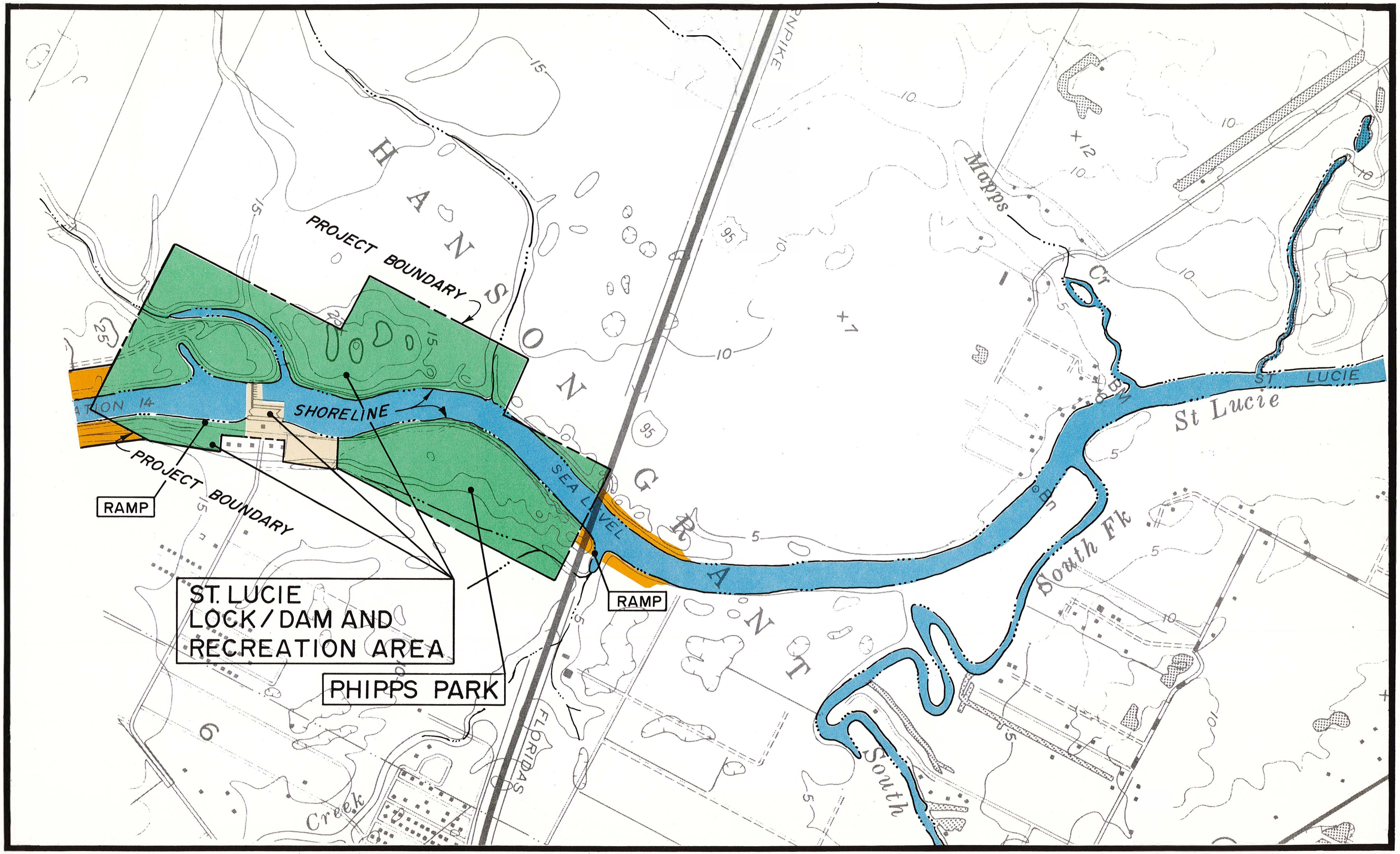
LAND MANAGEMENT CLASSIFICATION PLAN

PLATE X OF 52


PROJECT BOUNDARY
H A N S O N   G R A N T
SHORELINE
STATION 14
RAMP
PROJECT BOUNDARY
SEA LEVEL
RAMP
ST. LUCIE LOCK / DAM AND RECREATION AREA
PHIPPS PARK
FLORIDAS
TURNPIKE
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ST. LUCIE
St Lucie
South Fk
South
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Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

LEGEND:

🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

ST. LUCIE LOCK
ST. LUCIE CANAL

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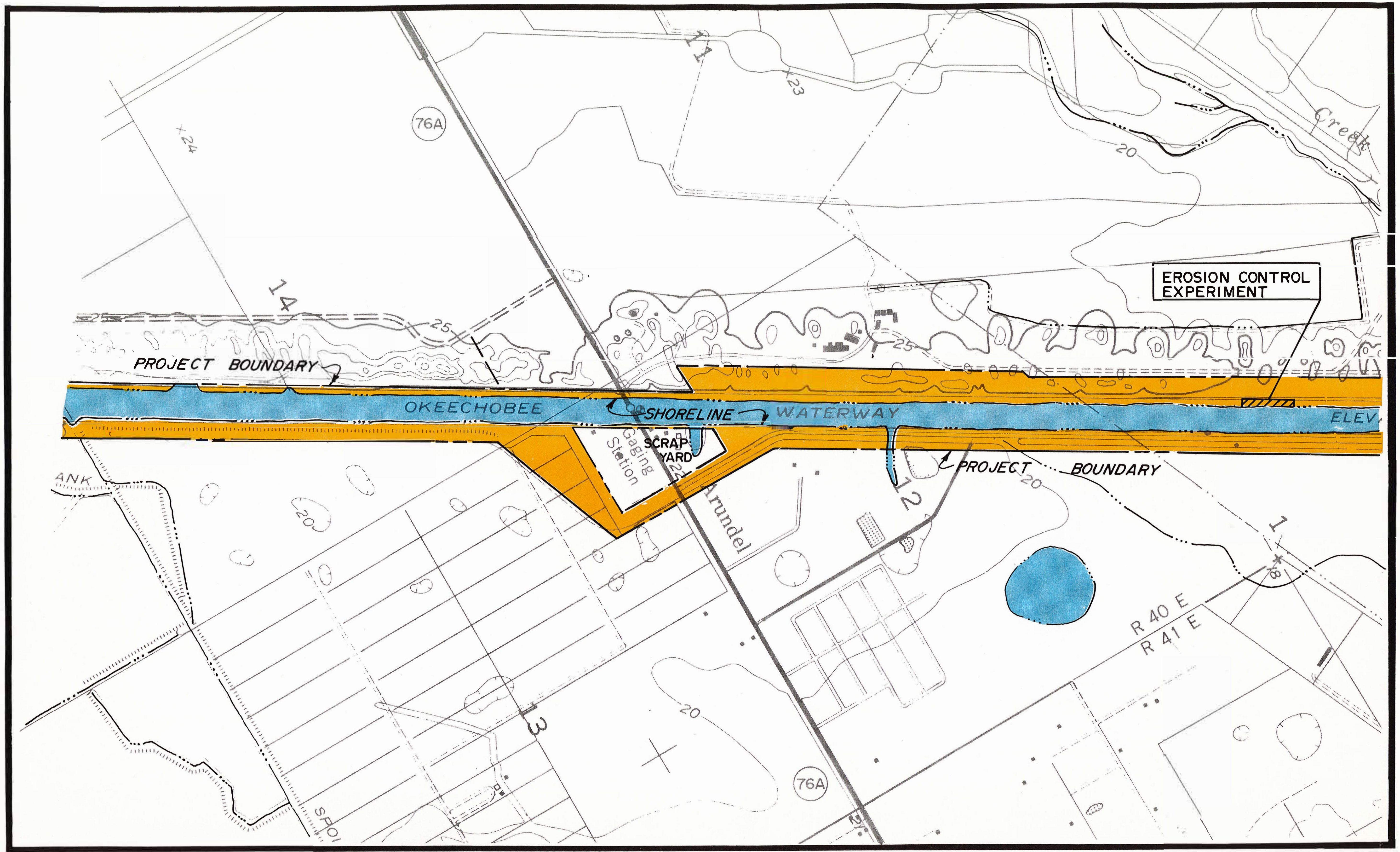
LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 1 OF 52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SCRAP YARD
Gaging Station
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SPO
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Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

LEGEND:

🟦 Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

ARUNDER
ST. LUCIE CANAL

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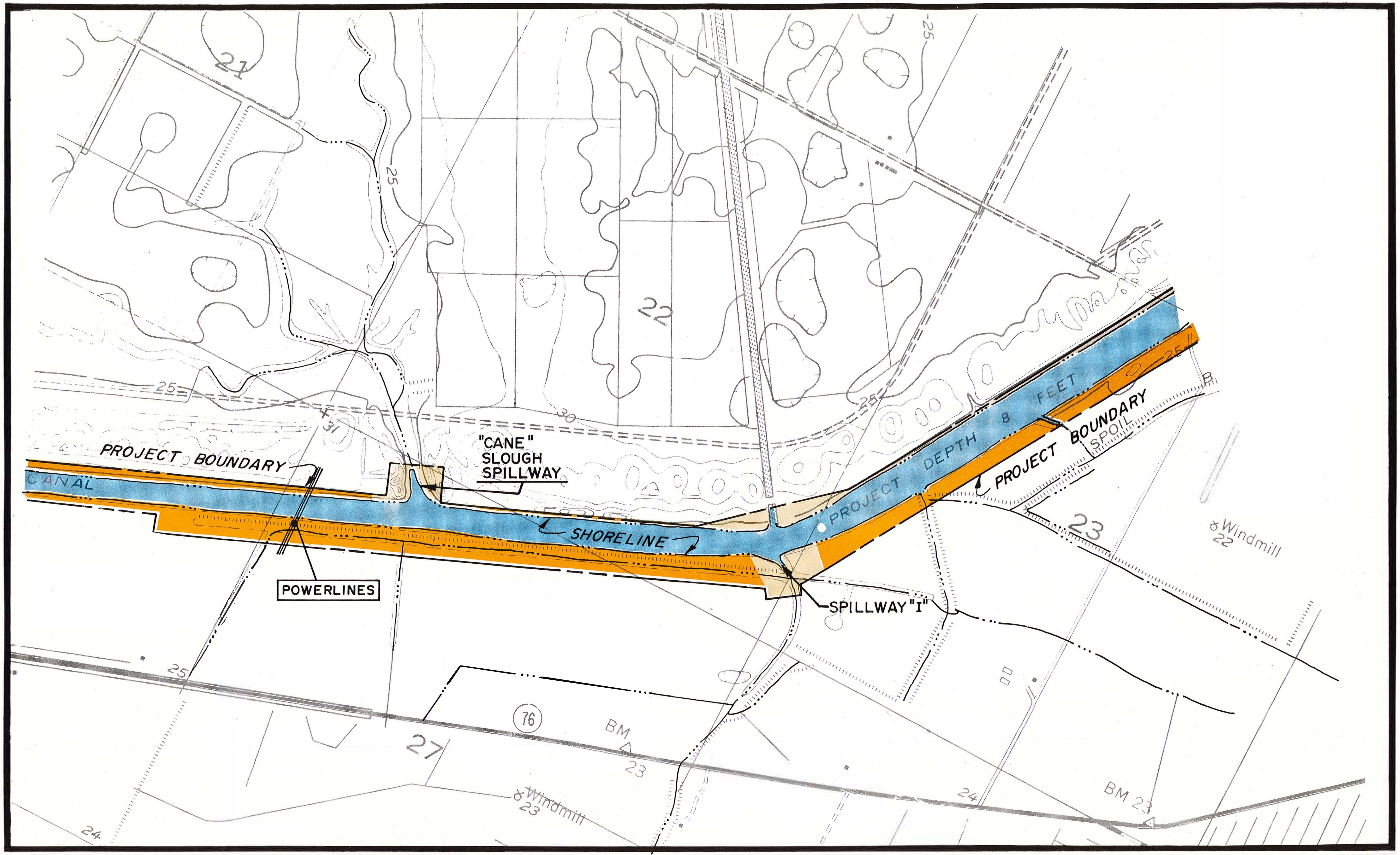
LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 2 OF 52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PROJECT BOUNDARY
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Windmill 23
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BM 23
24

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

LEGEND:

🟦 Water/Marsh
🟨 Project Operation
Recreation
▨ Fish and Wildlife
Natural Area
🟧 Waterway Corridor

CANE SLOUGH
ST. LUCIE CANAL

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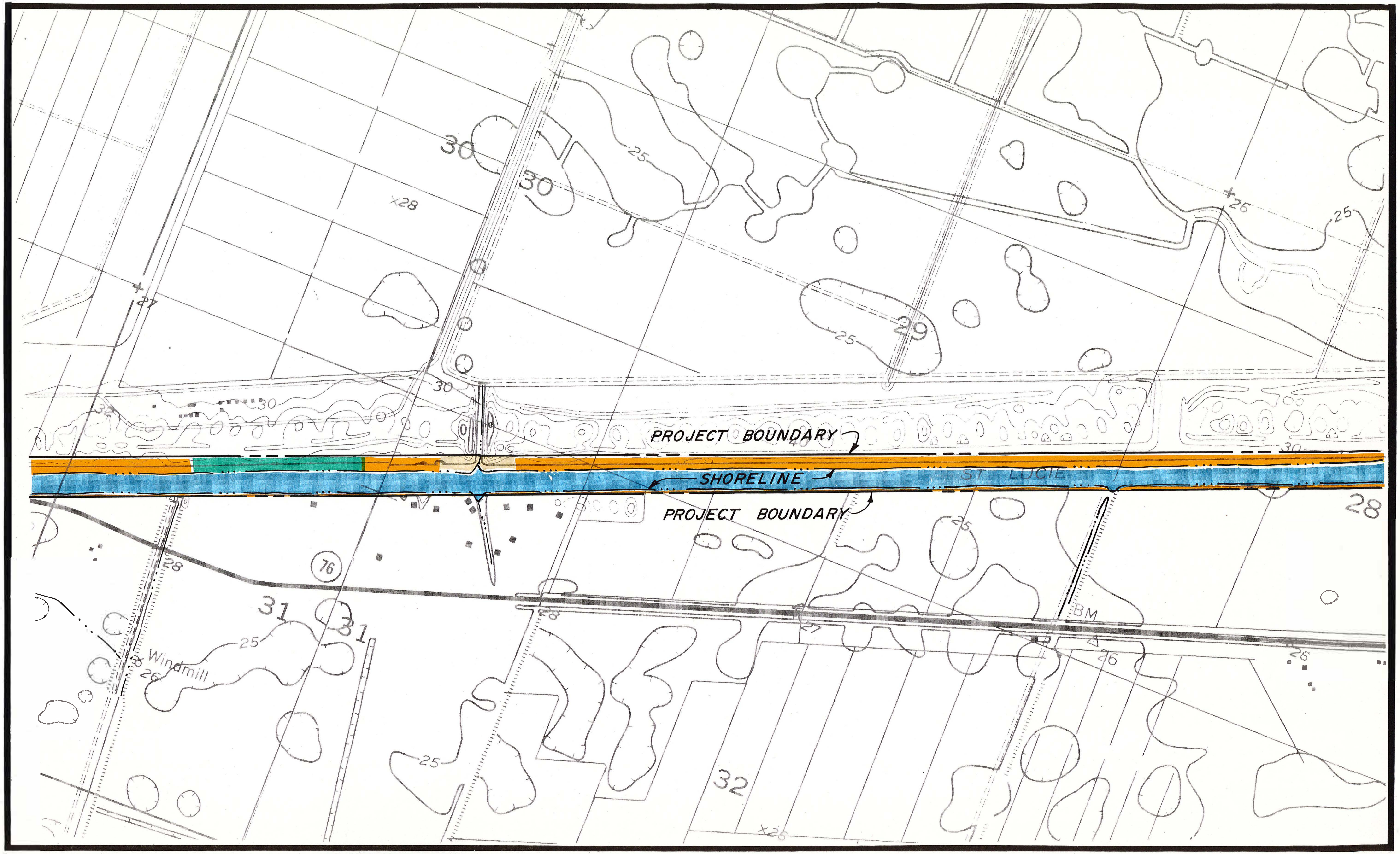
LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 3 OF 52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PROJECT BOUNDARY
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Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

**US Army Corps
of Engineers**
Jacksonville District

LEGEND:

Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

INDIANTOWN, SE
ST. LUCIE CANAL

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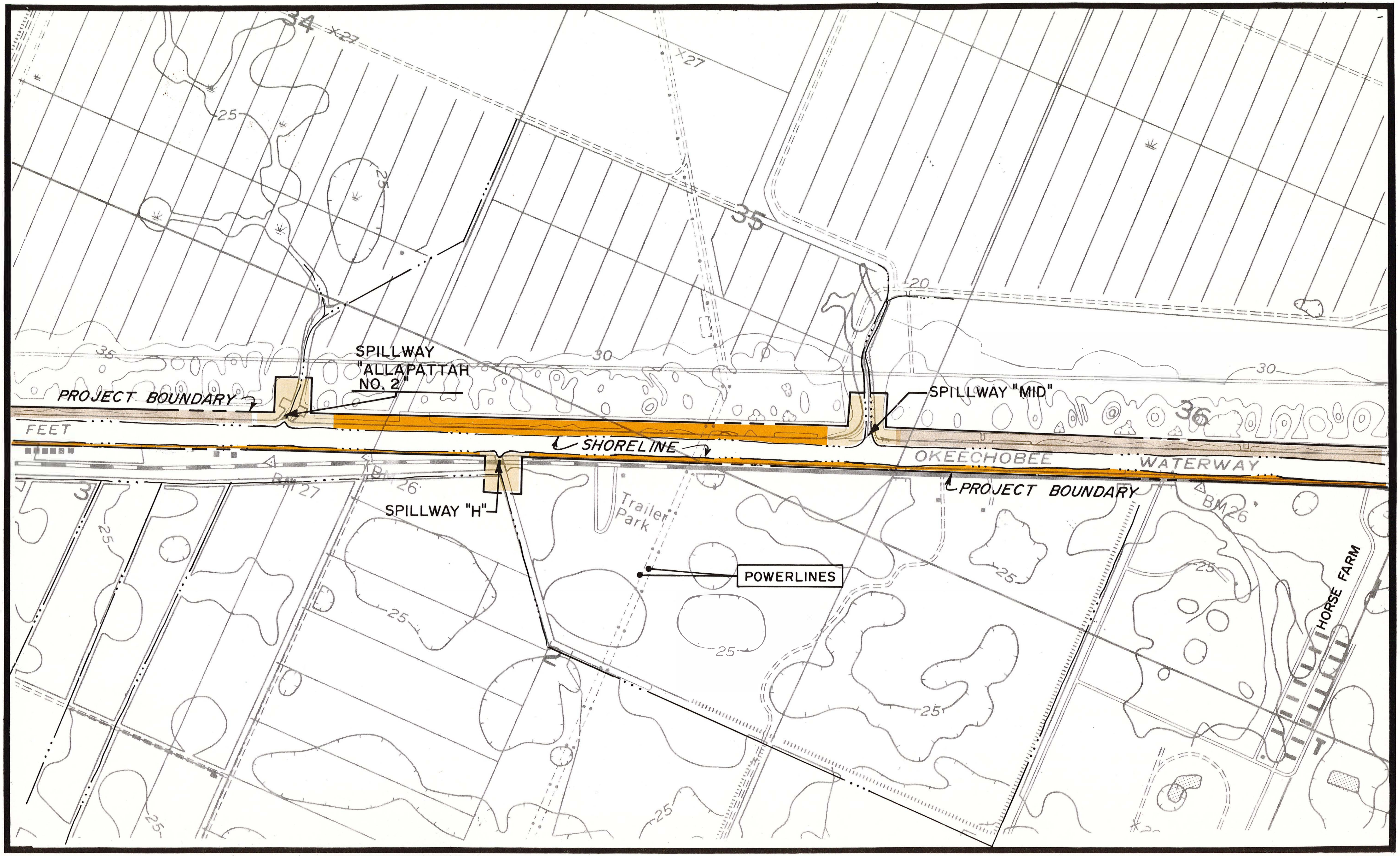
**LAND MANAGEMENT
CLASSIFICATION PLAN**

PLATE 4 OF 52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SPILLWAY "ALLAPATTAH NO. 2"
PROJECT BOUNDARY
SPILLWAY "MID"
FEET
SHORELINE
OKEECHOBEE WATERWAY
PROJECT BOUNDARY
BM 27
BM 26
BM 26
3
SPILLWAY "H"
Trailer Park
POWERLINES
HORSE FARM
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Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

LEGEND:

Water/Marsh
▨ Project Operation
Recreation
▨ Fish and Wildlife
Natural Area
▨ Waterway Corridor

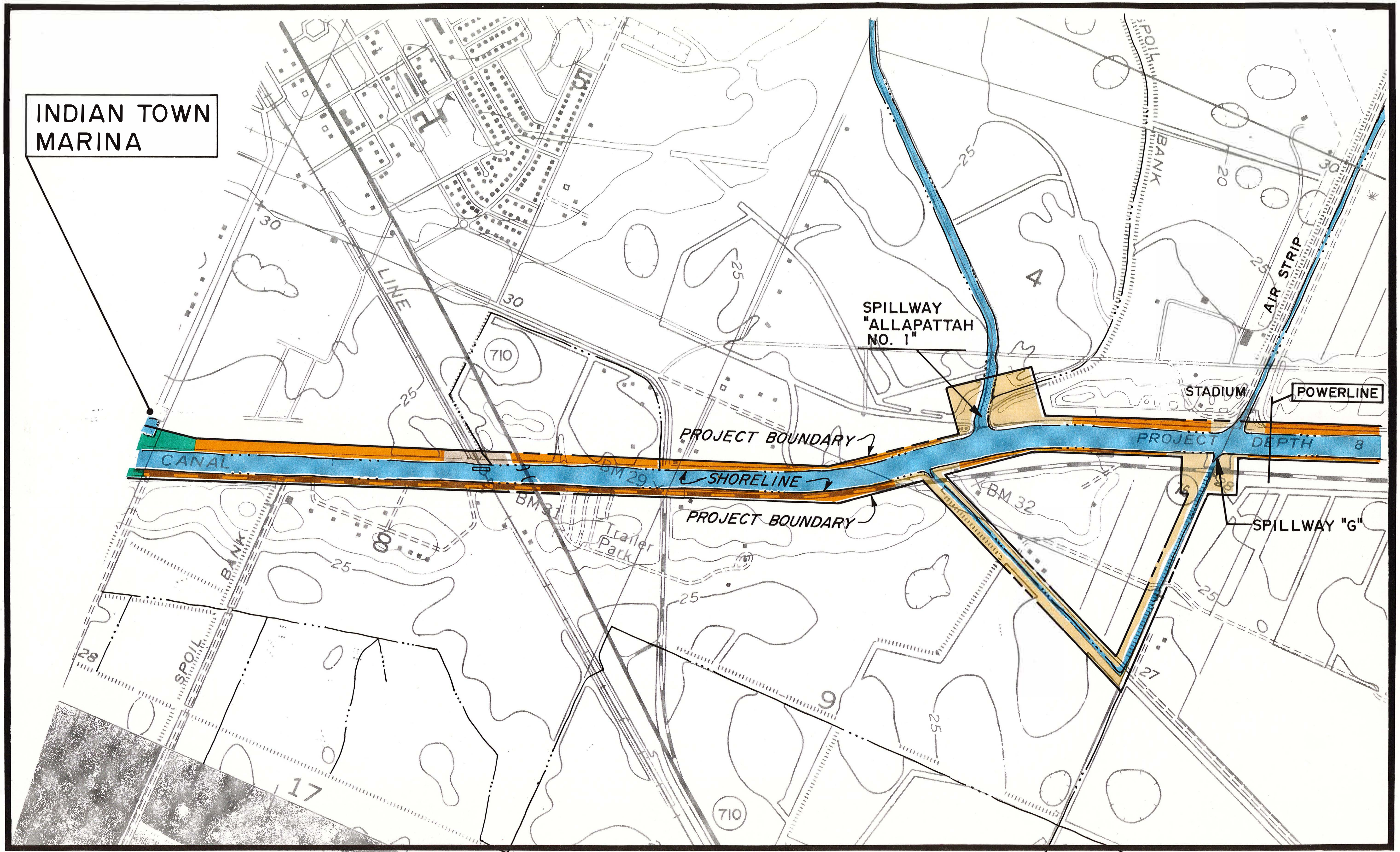
ALLAPATTAH NO. 2
ST. LUCIE CANAL

0 (FEET) 1000 2000 3000 SCALE

N

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 5 OF 52


INDIAN TOWN MARINA
SPILLWAY "ALLAPATTAH NO. 1"
STADIUM
POWERLINE
PROJECT DEPTH 8
SPILLWAY "G"
PROJECT BOUNDARY
SHORELINE
PROJECT BOUNDARY
CANAL
BM 29
BM 31
BM 32
Trailer Park
LINE
BANK
SPOIL
SPOIL
BANK
AIR STRIP
710
710
30
30
30
25
25
25
25
25
25
25
20
28
27
76
4
8
9
17

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

LEGEND:

🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
▨ Fish and Wildlife
Natural Area
🟧 Waterway Corridor

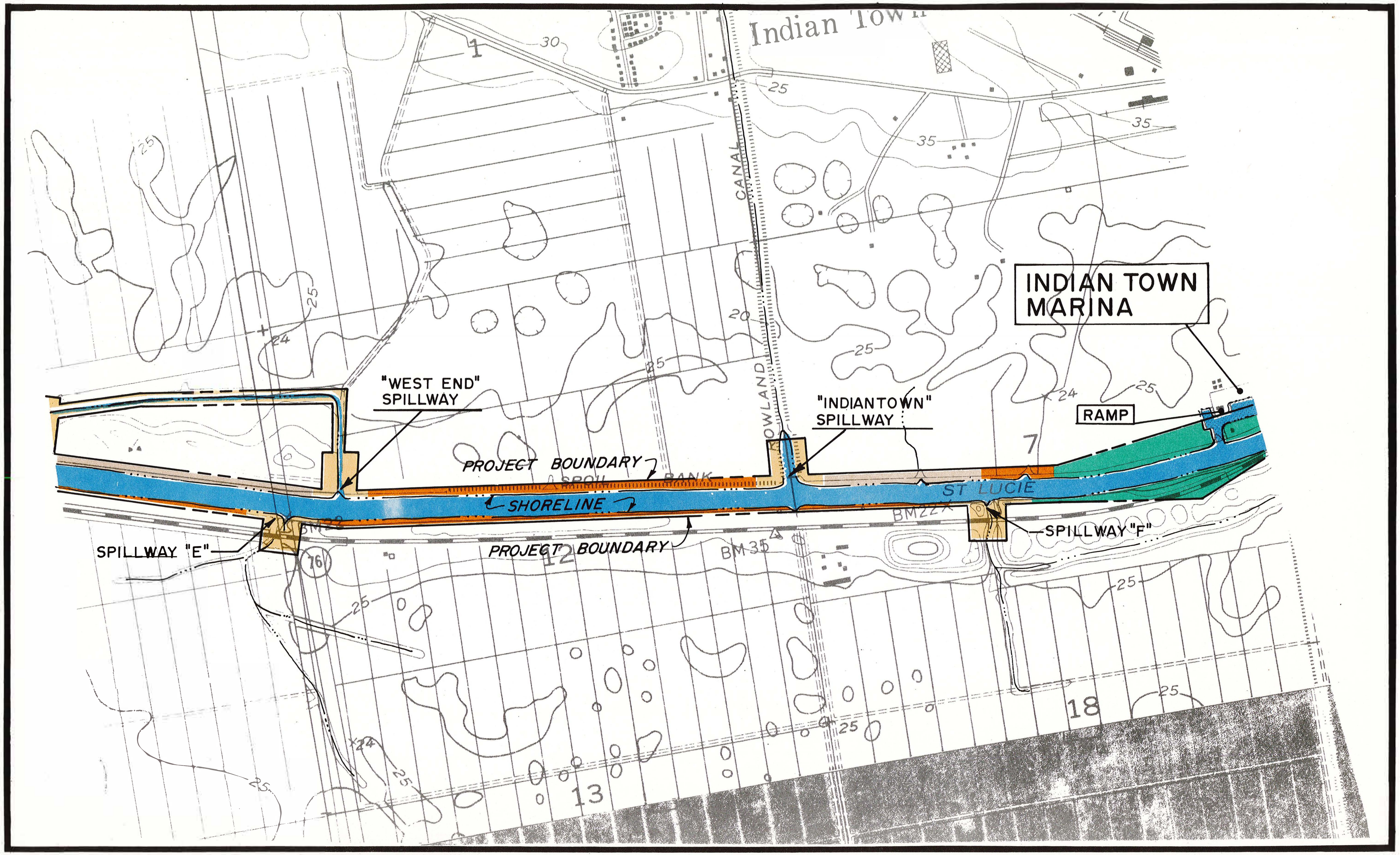
INDIAN TOWN
ST. LUCIE CANAL

N

0 (FEET) 1000 2000 3000
SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 6 OF 52


Indian Town
INDIAN TOWN MARINA
RAMP
"WEST END" SPILLWAY
"INDIANTOWN" SPILLWAY
PROJECT BOUNDARY
SPOIL BANK
SHORELINE
ST LUCIE
SPILLWAY "F"
SPILLWAY "E"
PROJECT BOUNDARY
CANAL
HOWLAND
BM 22
BM 22
BM 35
76
1
7
12
13
18
30
35
35
25
24
20

Master Plan for Public
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Jacksonville District

LEGEND:

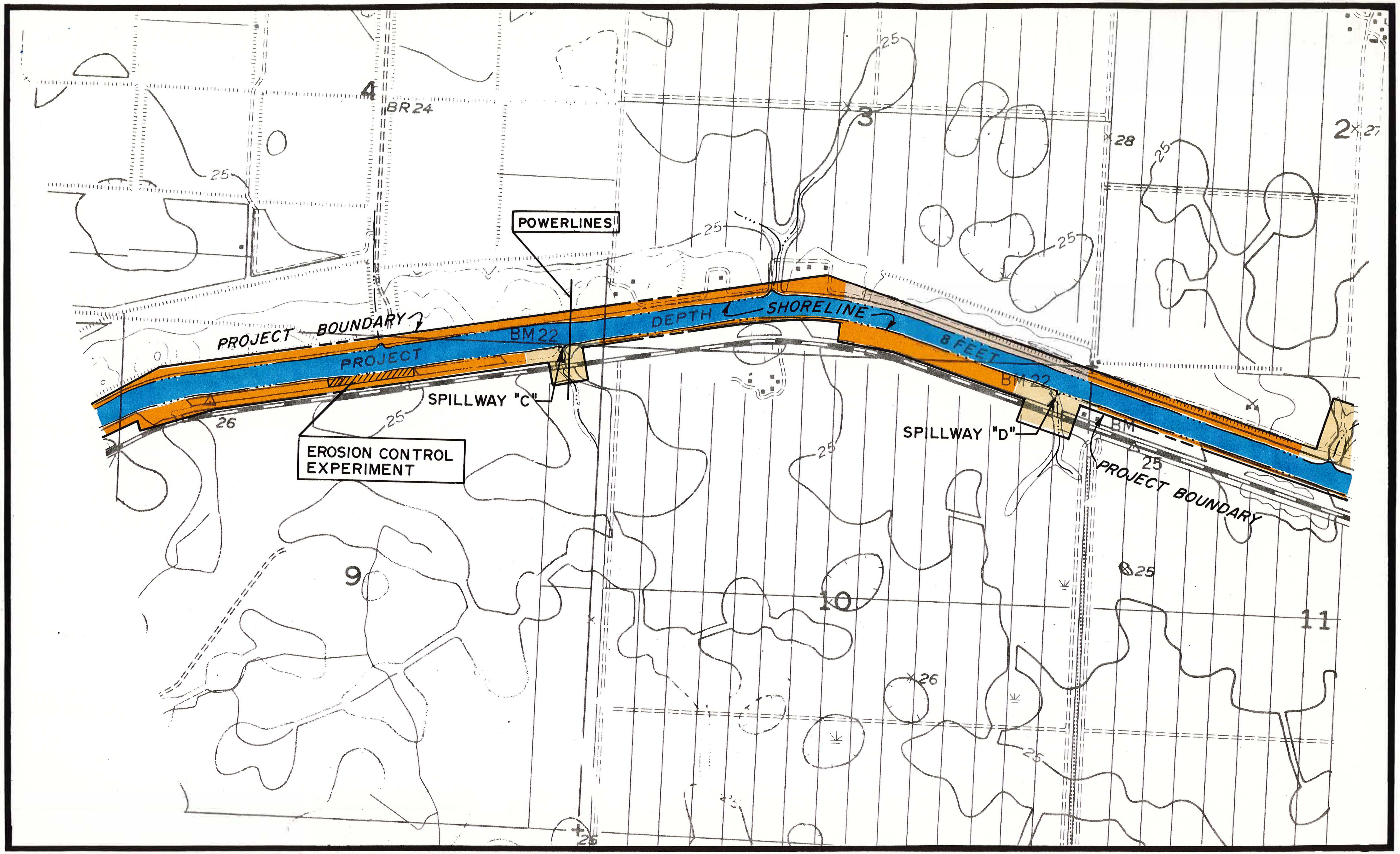
🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
▨ Fish and Wildlife
Natural Area
🟧 Waterway Corridor

INDIANTOWN MARINA
ST. LUCIE CANAL

0 (FEET) 1000 2000 3000
SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 7 OF 52


4
BR 24
3
2
28
25
POWERLINES
PROJECT BOUNDARY
PROJECT
BM 22
DEPTH
SHORELINE
8 FEET
BM 22
BM
SPILLWAY "C"
SPILLWAY "D"
EROSION CONTROL EXPERIMENT
PROJECT BOUNDARY
26
9
10
11
26
25

Master Plan for Public
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Jacksonville District

LEGEND:

🟦	Water/Marsh
🟨	Project Operation
	Recreation
▨	Fish and Wildlife
	Natural Area
🟧	Waterway Corridor

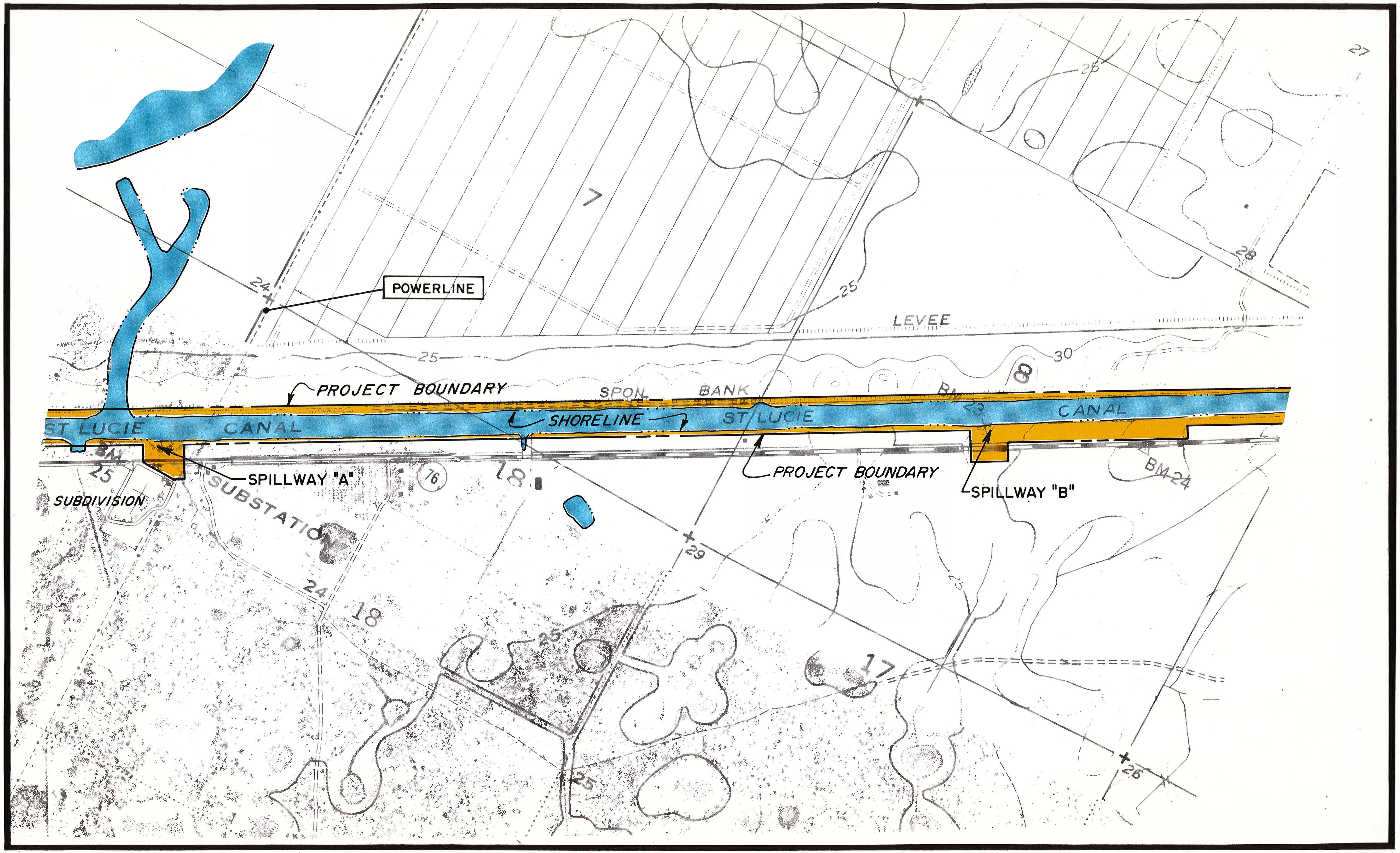
SPILLWAYS C & D
ST. LUCIE CANAL

0 (FEET) 1000 2000 3000 SCALE

N

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 8 OF 52


POWERLINE
7
24
25
25
LEVEE
27
26
28
30
8
PROJECT BOUNDARY
SPOIL BANK
SHORELINE
ST LUCIE CANAL
ST LUCIE CANAL
BM 23
BM 24
BM 25
SPILLWAY "A"
SPILLWAY "B"
PROJECT BOUNDARY
SUBDIVISION
SUBSTATION
76
18
29
24
18
25
17
25
26

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Jacksonville District

LEGEND:

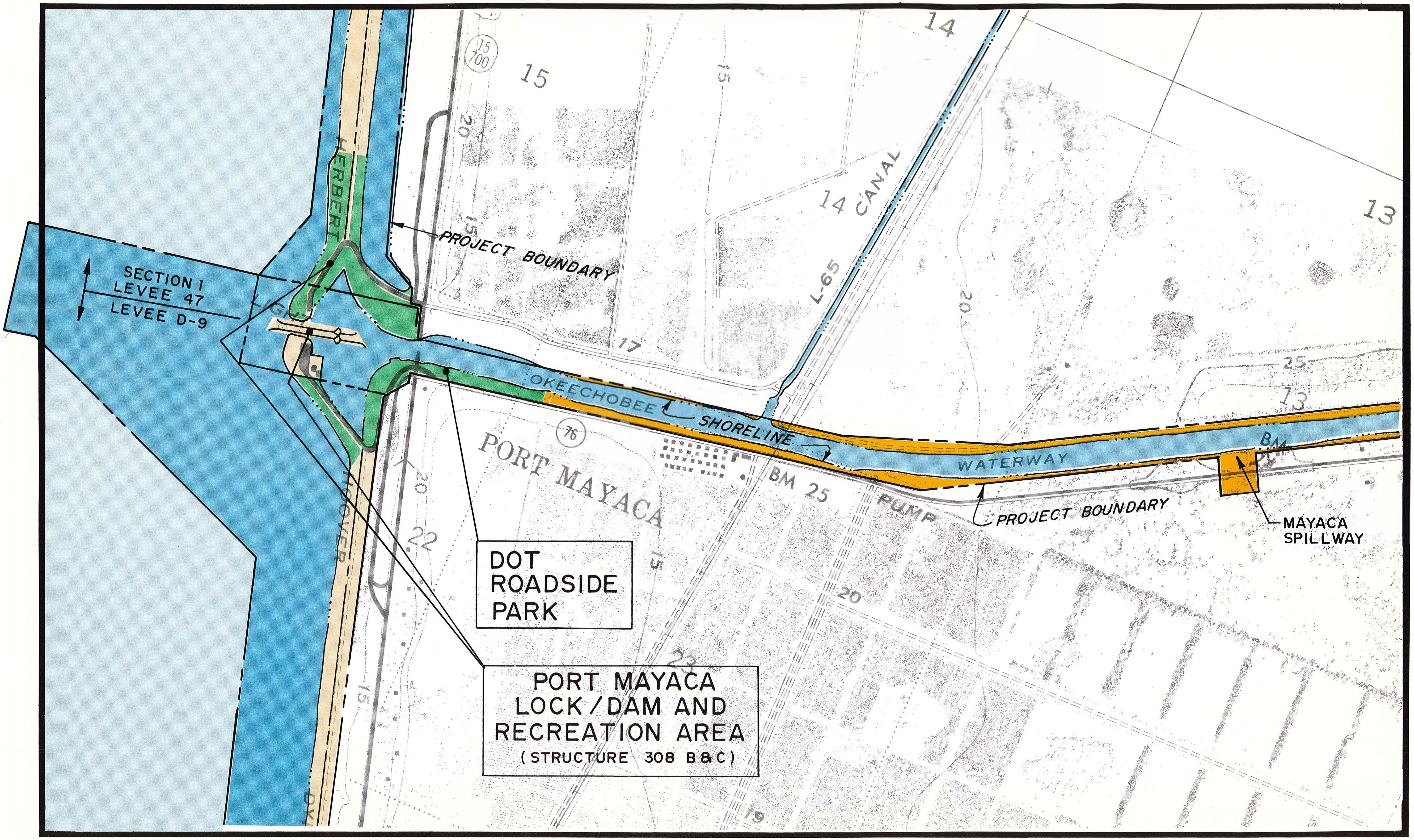
🟦 Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

SPILLWAYS A & B
ST. LUCIE CANAL

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 9 OF 52


SECTION 1
LEVEE 47
LEVEE D-9
HERBERT
HOOVER
DY
LIGH
PROJECT BOUNDARY
OKEECHOBEE
SHORELINE
WATERWAY
L-65
14 CANAL
PORT MAYACA
BM 25
PUMP
PROJECT BOUNDARY
MAYACA SPILLWAY
BM
76
15 700
15
14
13
17
20
22
23
25
19
DOT ROADSIDE PARK
PORT MAYACA LOCK/DAM AND RECREATION AREA (STRUCTURE 308 B&C)

Master Plan for Public Use Development and Resource Management
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LEGEND:
- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- Fish and Wildlife
- Natural Area
- 🟧 Waterway Corridor

PORT MAYACA
ST. LUCIE CANAL

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 10 OF 52

Windmill
Windmill
4
LEVEE
BR 20
3
LEVEE
PROJECT BOUNDARY
SHORELINE
SHORELINE
LEVEE 47
SECTION I
LEVEE RIDGE CENTERLINE
700
15
441
98
2
10
10
BM
Sand Pit
11
Bessemer
BM 20
16
15
14
CANAL
L-65
HERBERT
SECTION I
LEVEE 47
LEVEE D-9
LIGHT
RAMP
OKEECHOBEE
WATERWAY
SHORELINE
76
PORT MAYACA
BM 25
PORT MAYACA
LOCK/ DAM AND
RECREATION AREA
(STRUCTURES 308 B AND C)
HOOVER
DYKE
LEVEE RIDGE CENTERLINE
22
23
DOT
ROADSIDE
PARK
PROJECT BOUNDARY

MATCH LINE A-A

Master Plan for Public
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LEGEND:
Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

PORT MAYACA
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 11 OF 52

MATCH LINE B-B
BM
25
MARTIN CO
PALM BEACH CO
LAKE OKEECHOBEE
FLORIDA
CULVERT 16
PROJECT BOUNDARY
MATCH LINE A-A
EAST
CO
PUMP
26
CULVERT 11
MATCH LINE B-B
T.40 S
T 41 S
WATERWAY
SHORELINE
LEVEE-D9
2
1
LEVEE RIDGE CENTERLINE
ELEVATION 16
CULVERT 14
OKEECHOBEE
CULVERT 10A
PUMP
22
MACEDONIA
CH
14
14
13
×14
PROJECT BOUNDARY
CULVERT 13
DYKE

Master Plan for Public
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LEGEND:

- Water/Marsh
- Project Operation
- Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

MACEDONIA
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 12 OF 52

CANAL POINT RECREATION AREA
RAMP
HURRICANE GATE NO. 5
LEVEE D-9
LEVEE 10
PROJECT BOUNDARY
SHORELINE
LEVEE RIDGE CENTERLINE
HERBERT HOOVER
DIKE
WATERWAY
LIGHT
CANAL
GAGING STA
W PALM BEACH CANAL
GLADES PARK
CANAL POINT
(BM 26)
BRYANT
PUMP
WEST
SEWAGE DISPOSAL
INDUSTRIAL WASTE POND
INDUSTRIAL WASTE PONDS
LANDING STRIP
PRIVATE
23
25 X12
26 X12
27
27 X12
35 X12
34
33
3 X12
3
2 X12
4
10 X12
10
15
19
16
18
13
98
700
441

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Jacksonville District

LEGEND:

🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

CANAL POINT
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 13 OF 52

PAHOKEE STATE PARK
RAMP
LEVEE D-9
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
SHORELINE
PROJECT BOUNDARY
OKEECHOBEE
RADIO TOWER
HERBERT
SHOLLKEY RD
ROCK PIT RD
BOTTOM ROAD
BAY
PUMP
LARRIMORE RD
EVERGLADES MEM HOSPITAL
PAHOKEE
EAST LAKE
ISLAND
PELICAN ISLAND
PADGETT
EAST
BACON POINT ROAD
SEWAGE DISPOSAL
BUILDER
LAKE
441
15
715
8
9
10
13
14
15
16
17
18
19
20
24
13

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LEGEND:

🟦	Water/Marsh
🟨	Project Operation
🟩	Recreation
	Fish and Wildlife
	Natural Area
	Waterway Corridor

PAHOKEE
LAKE OKEECHOBEE

N

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 14 OF 52

LEVEE D-9
LEVEE D-2
BACOM POINT
LAKESIDE CH
23
17
PUMP
25
CULVERT 10
PROJECT BOUNDARY
HERBERT
15
16
SCHOOL
BALL FIELDS
26
12
PALM BEACH CO GLADES AIRPORT
15
HOOVER
10
13
RADIO TOWER
13
12
17
14
LEVEE RIDGE CENTERLINE
BACOM POINT RECREATION AREA
PUMP
CULVERT 12-A
10
DIKE
RIM
OKEECHOBEE
14
SHORELINE
PROJECT BOUNDARY
PELICAN
BAY
CANAL
10
WATERWAY
10
715
10

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LEGEND:

- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- ▨ Fish and Wildlife Natural Area Waterway Corridor

BACOM POINT
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 15 OF 52

RARDIN PARK
RAMP
CULVERT 12
715
MOBILE HOME PARK
R37E
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
SHORELINE
LEVEE D-2
PUMP
KANYON
COAST
PROJECT BOUNDARY
CANAL
WHITE
BELLE GLADE PARK RECREATION AREA
TORRY ISLAND
RAMP
LEVEE PICNIC AREA
PICNIC AREA
RAMP
CAMPGROUND
HILLSBORO
CANAL
SEWAGE DISPOSAL
GOLF COURSE
GAGING STATIONS
HURRICANE GATE NO. 4 (STRUCTURE NO. 2)
GAGING STA
PUMP
RIM
STA

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LEGEND:
- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- 🟫 Fish and Wildlife
- Natural Area
- Waterway Corridor

TORRY ISLAND
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 16 OF 52

HALIFAX BAN
BM 13
PROJECT BOUNDARY
SOUTH
BAY
CANAL
LEVEE D-2
BEAN CITY
SHORELINE
22
CULVERT 4A
27
80
BM 14
9
X14
LEVEE RIDGE CENTERLINE
SHORELINE
SOUTH
BAY
FLORIDA
SHORELINE
RAMP
HERBERT
HOOVER
PROJECT
BOUNDARY
SOUTH BAY
RECREATION
AREA
FILTRATION
PLANT
10
10
PUMP
PUMP
15
X12
EAST
X10 PUMP

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LEGEND:

Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

SOUTH BAY
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 17 OF 52

RITTA ISLAND
23
X 14
15
26
25
35
PUMP
PUMP
SHORELINE
PROJECT BOUNDARY
RAMP
STRUCTURE 3
SHORELINE
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
RIM
PUMP
GATE
27
98
LAKE HARBOR
JOHN H. STRETCH MEMORIAL PARK
HURRICANE GATE NO. 3
R 35 E
R 36 E
1
X 13
6
17
16
15
21
11
X 13
12
X 13
7
X 11
FLORIDA
1
2
3
4

Master Plan for Public
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LEGEND:

🟦	Water/Marsh
🟨	Project Operation
🟩	Recreation
▨	Fish and Wildlife
	Natural Area
	Waterway Corridor

LAKE HARBOR
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 18 OF 52

PROJECT BOUNDARY
HOOVER DIKE
℄ SHORELINE
LITTLE BARE BEACH
PUMP
STRUCTURE 236
CULVERT 3
LAKE OBSERVATION POINT (LITTLE BARE BEACH)
RIM
LEVEE RIDGE CENTERLINE
CANAL
LEVEE D-2
SEWAGE DISPOSAL
LANDING STRIP
COAST
WATSON
PROJECT BOUNDARY
T 43 S
T 44 S
19
30
29
32
33
34
4
3
21
27
98
78
13
14
15
× 12
× 13
× 14

Master Plan for Public
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LEGEND:

- Water/Marsh
- Project Operation
- Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

LITTLE BARE BEACH
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 19 OF 52

EROSION CONTROL EXPERIMENT
CULVERT 2
CLEWISTON RECREATION AREA
RAMP
RAMP
CLEWISTON LOCK (HURRICANE GATE NO. 2) (STRUCTURE 310)
CLEWISTON AREA OFFICE
JOLLY ROGER MARINIA
INDUSTRIAL CANAL
LEVEE D-2
LEVEE D-1
LEVEE D-2
LIGHT
COOT BAY
PROJECT BOUNDARY
SHORELINE
RIM CANAL
LEVEE RIDGE CENTERLINE
HERBERT HOOVER DIKE
BOUNDARY
LAKE OKEECHOBEE ELEVATION 16
CLEWISTON
SUBDIVISION
SUBDIVISON
SUGARLAND PARK
SUGAR JUNCTION
HOOKER POINT
GRAVEL PIT
RADIO TOWER
SEWAGE DISP
TRAILER PARK
PUMP
INDEFINITE LANE
PROJECT BOUNDARY
HENDRY CO
PALM BEACH
27
25
80
832
BM 16
BM 18

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LEGEND:

- Water/Marsh
- Project Operation
- Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

CLEWISTON
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 20 OF 52

LIBERTY POINT
RIM
CANAL
RAMP
UNCLE JOE'S FISH CAMP
TRAIL
PROJECT BOUNDARY
70
15
26
26
24
17
R 33 E
R 34 E
BM 17
BM 15
17
25
19
LEVEE D-I
14
LINE
COAST
720
16
36
17
30
GRASS ISLAND
PUMP
BM
STRUCTURE 4
BM 34
BM 31
17
R 33 E
R 34
CO
CO
31
17
SHAWNEE
14
SHORELINE
HERBERT
OKEECHOBEE
PROJECT BOUNDARY
PUMP
T 42 S
T 43 S
SUGARTON
HOOVER
WATERWAY
22
PUMP
15
8
20
BM 33
SHORELINE

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LEGEND:

🟦 Water/Marsh
▨ Project Operation
🟩 Recreation
Fish and Wildlife
▨ Natural Area
Waterway Corridor

LIBERTY POINT
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

N

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 21 OF 52

LEVEE D-1
PROJECT BOUNDARY
OKEECHOBEE
WATERWAY
SHORELINE
LEVEE RIDGE CENTERLINE
RIM
CANAL
PUMP
CULVERT IA
BENBOW
SEWAGE DISPOSAL
GRAMLIN NO 2
SEABOARD
BENBOW NO 2
BENBOW NO 2
LINE
BM
720
15
16
17
21
22
23
AIRBOAT

Master Plan for Public
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LEGEND:

🟦	Water/Marsh
🟨	Project Operation
	Recreation
⬜	Fish and Wildlife
	Natural Area
	Waterway Corridor

BENBOW
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 22 OF 52

LEVEE D-3
RIM CANAL
PROJECT BOUNDARY
LEVEE RIDGE CENTERLINE
SHORELINE
RAMP
MOORE HAVEN LOCK / DAM AND RECREATION AREA (HURRICANE GATE NO. 1)
MOORE HAVEN CITY PARK
LEVEE D-3
LEVEE D-1
PROJECT BOUNDARY
SHORELINE
CANAL
STRUCTURE 77
SHORELINE
25
35
27
12
R 32 E
R 33 E
PROJECT BOUNDARY
CULVERT 1
LEVEE D-1
13
INDUSTRIAL WASTE PONDS
24

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LEGEND:

Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

MOORE HAVEN
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 23 OF 52

9
CULVERT 5
INDIAN MOUND
10
17
PROJECT BOUNDARY
NICODEMUS SLOUGH
17X
16
CANAL
HERBERT HOOVER DYKE
21
LEVEE D-3
LEVEE RIDGE CENTERLINE
SHORELINE
CULVERT 5A
RIM CANAL
28
15
78
27
PROJECT BOUNDARY
BM 19
33
22

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LEGEND:

- 🟦 Water/Marsh
- 🟨 Project Operation
- Recreation
- ▨ Fish and Wildlife
- Natural Area
- Waterway Corridor

NICODEMUS SLOUGH
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 24 OF 52

BM 20
BM 22
21
21
20
LAKEPORT
WATER TANK
LAKEPORT CH
15
22
20
ACCESS POINT/ RAMP
LEVEE 50
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
SHORELINE
CREEK
RAMP
FISHEATING CREEK RECREATION AREA
MIC
28
28
39
41
FISHEATING
BM 21
27
18
33
CREEK
BM 21
33
20
34
20
INDIAN MOUNDS
ISL
CURRY
19
LEVEE D-3
PROJECT BOUNDARY
RIM
DYKE
CANAL
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
BM 18
3
4
4
20
18
SPORTSMAN VILLAGE
SHORELINE
RAMP
BM 21
INDIAN MOUND

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LEGEND:
Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

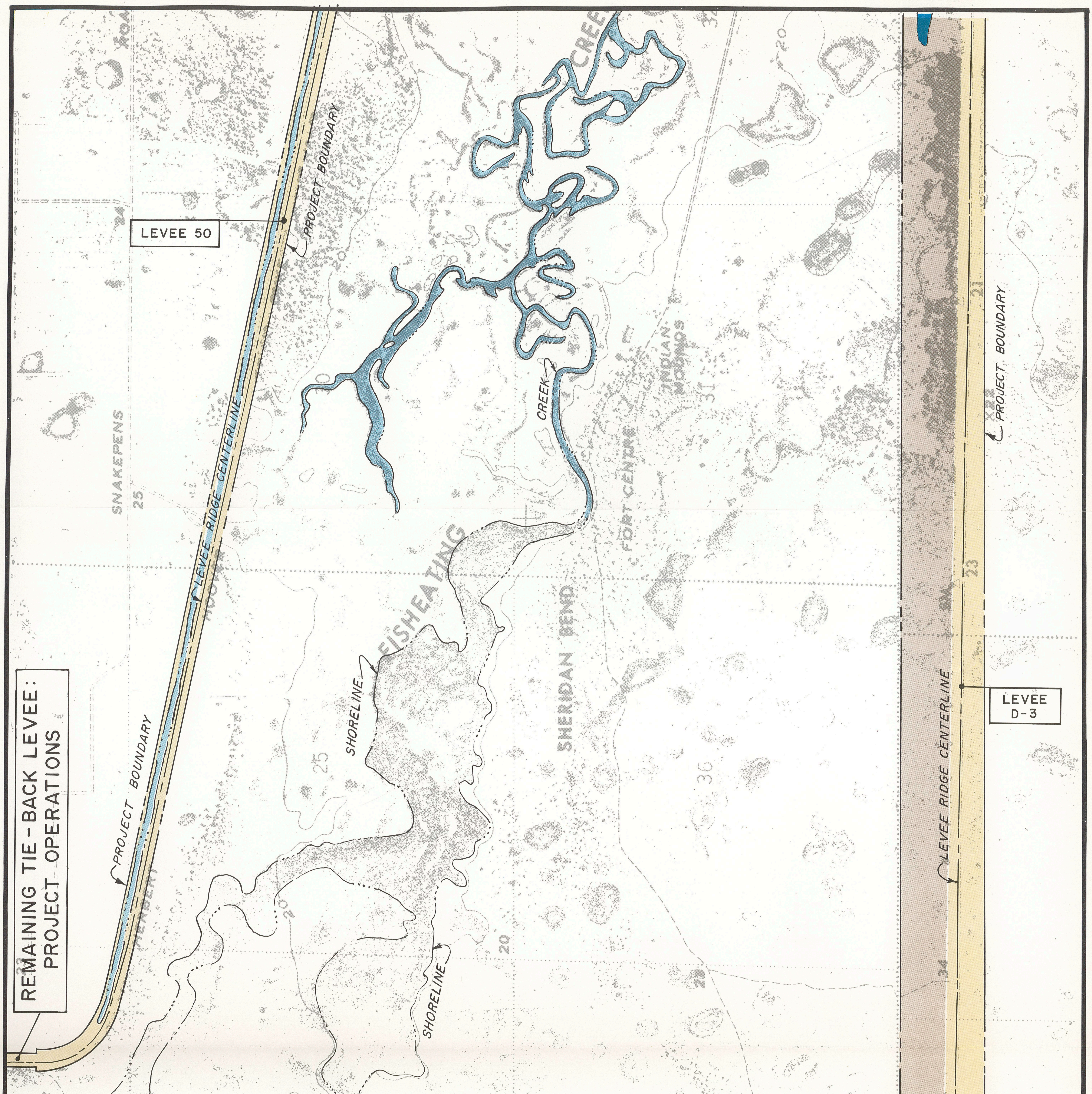
LAKEPORT
LAKE OKEECHOBEE

N

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 25 OF 52


LEVEE 50
PROJECT BOUNDARY
LEVEE RIDGE CENTERLINE
REMAINING TIE-BACK LEVEE: PROJECT OPERATIONS
PROJECT BOUNDARY
SNAKEPENS
CREEK
CREEK
FISHEATING
SHORELINE
SHORELINE
SHERIDAN BEND
FORT CENTRE
INDIAN MOUNDS
PROJECT BOUNDARY
LEVEE D-3
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
REMAINING TIE-BACK LEVEE: FISH AND WILDLIFE, PROJECT OPERATIONS
DYKE
RSH
BM
25
24
20
30
31
36
35
34
26
27
21
23
22
25

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LEGEND:
🟦 Water/Marsh
🟨 Project Operation
Recreation
▨ Fish and Wildlife
Natural Area
Waterway Corridor

FISHEATING CREEK
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 26 OF 52

BIG BARE BEACH RECREATION AREA
PROJECT BOUNDARY
BOAT CANAL
RAMP
LEVEE RIDGE CENTERLINE
LEVEE 49
CANAL 41
PROJECT BOUNDARY
RAMP
HARNEY POND RECREATION AREA
HARNEY POND CANAL
PROJECT BOUNDARY
FOOTBRIDGE
LEVEE 50
SUBDIVISION
LEVEE RIDGE CENTERLINE
SUBDIVISON
FISHEATING CREEK LOCK (STRUCTURE NO. 131)
FISHEATING BAY
HERBERT HOOVER DYKE
SHORELINE
SHORELINE
PROJECT BOUNDARY
BRIGHTON INDIAN RESERVATION
Sarasota Colony
SPOIL BANK
LEVEE
RES BDY

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LEGEND:
- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- ⬜ Fish and Wildlife
- Natural Area
- Waterway Corridor

HARNEY POND
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 27 OF 52

PROJECT BOUNDARY
STRUCTURE-129
SHORELINE
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
LEVEE 49
BOAT CANAL
LAKE OKEECHOBEE
APPROXIMATE MEAN LAKE ELEVATION 14 FEET
35
35
34
33
3
10
4
9
5
8
78
BR 19
BR 19
T 39 S
T 40 S
LEVEE
LEVEE
LEVEE
LEVEE
Flowing Well
MC
Δ20
x17
x14
x16
15
16
17
18
20

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LEGEND:

🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
▨ Fish and Wildlife
Natural Area
Waterway Corridor

BARE BEACH
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 28 OF 52

SPOIL BANK
BM 18
LEVEE 48
PROJECT BOUNDARY
LEVEE RIDGE CENTERLINE
18
19
24
25
26
36
R 33 E
R 34 E
78
PROJECT BOUNDARY
INDIAN PRAIRIE CANAL
SHORELINE
RAMP
CANAL 40
Gaging Station
BM 19
BM 17
PROJECT BOUNDARY
INDIAN PRAIRIE RECREATION AREA
LEVEE 49
SHORELINE
LEVEE RIDGE CENTERLINE
PROJECT BOUNDARY
BR 19
15
16
17
18

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LEGEND:

🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
⬜ Fish and Wildlife
Natural Area
Waterway Corridor

INDIAN PRAIRIE
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 29 OF 52

BUCKHEAD RIDGE
MARINIA
BUCKHEAD RIDGE
LOCK AND
RECREATION AREA
(STRUCTION 127)
RAMP
PROJECT BOUNDARY
SUBDIVISION
SUBDIVISION
SUBDIVISION
SUBDIVISION
SUBDIVISION
Buckhead Ridge
LEVEE
T 38 S
T 39 S
SHORELINE
LEVEE RIDGE CENTERLINE
LEVEE 48
PROJECT BOUNDARY
27
35
34
34
33
3
4
9
8
16
17
BR 22
BM 18
78
78
22
22
22

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LEGEND:

Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

BUCKHEAD RIDGE
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 30 OF 52

PROJECT BOUNDARY
PROJECT BOUNDARY
HOMES
LEVEE RIDGE CENTERLINE
HOMES
SUBDIVISION
SUBDIVISION
SHORELINE
LEVEE D-4
OKEE-TANTIE RECREATION AREA AND MARINA
Floodgate
BM 24
RAMP
RAMP
SHORELINE
CANAL 38
LEVEE 48
KISSIMMEE RIVER
SUBDIVISION
ACCESS POINT/RAMP
BM 23
78
x17
x16
13x
SUBDIVISION
LEVEE
SUBDIVISION
LEVEE 48
GLADES CO
OKEECHOBEE CO
LAKE OKEECHOBEE
APPROXIMATE MEAN LAKE ELEVATION 14
head
13
24
25
26
36
20
19
16
15

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LEGEND:

🟦	Water/Marsh
▨	Project Operation
🟩	Recreation
▨	Fish and Wildlife
	Natural Area
	Waterway Corridor

KISSIMMEE RIVER
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 31 OF 52

SUBDIVISION DEVELOPMENT
ACCESS POINT / RAMP
HOMES
RAMP
SUBDIVISION DEVELOPMENT
HOMES
HOMES
SHORELINE
PROJECT BOUNDARY
STRUCTURE 133
TAYLOR CREEK LOCK (S-193) & HURRICANE GATE 6
LEVEE
SHORELINE
LEVEE D-4
TAYLOR
CREEK
GOLF COURSE
CAMPGROUND
DEVELOPMENT
LEVEE RIDGE CENTERLINE
SUBDIVISION
OKEECHOBEE RECREATION AREA
CULVERT 7
SHORELINE
RAMP
Eagle Bay
LEVEE
PROJECT BOUNDARY
Creek
Lemkin
Water Tank
Waterworks
26
27
34
33
4
32
700
15
98

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LEGEND:

Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

TAYLOR CREEK
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 32 OF 52

SUBDIVISION DEVELOPMENT
LEVEE D-4
PROJECT BOUNDARY
LEVEE RIDGE CENTERLINE
HOMES
CULVERT 8
CULVERT 9
SHORELINE
RAMP
STRUCTURE 191
LEVEE D-4
LEVEE 47 SECTION 2
NUBBIN SLOUGH RECREATION AREA
MOBILE HOMES
LEVEE
SHORELINE
HOMES
PROJECT BOUNDARY
LEVEE RIDGE CENTERLINE
LEVEE 47 SECTION 2
SEABOARD COAST LINE
Mosquito
Creek
R 35 E
R 36 E
Sherman
BM 28
24
25
36
30
31
29
6
5
32
33
4
98
441
700
15
710

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LEGEND:
- Water/Marsh
- Project Operation
- Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

NUBBIN SLOUGH
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 33 OF 52

HENRY CREEK LOCK
(G-36)
AND RECREATION
AREA
RAMP
LEVEE 47
SECTION 2
LEVEE RIDGE CENTERLINE
SHORELINE
SHORELINE
PROJECT BOUNDARY
PROJECT BOUNDARY
HOMES
HOMES
HOMES
SEABOARD
COAST
LINE
SPOIL BANK
SPOIL BANK
SPOIL BANK
Henry Creek
Lettuce
Windmill
BR 20
BR 21
BR 27
BR 28
BM 23
BM 24
BM 28
3
9
10
11
13
14
15
23
24
710
714

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Resource Management
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LEGEND:

- Water/Marsh
- Project Operation
- Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

HENRY CREEK
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 34 OF 52

PROJECT BOUNDARY
SHORELINE
LEVEE RIDGE CENTERLINE
SHORELINE
OKEECHOBEE CO
MARTIN CO
LEVEE 47
SECTION 2
MARSH
PROJECT BOUNDARY
RAMP
OKEECHOBEE CO
MARTIN CO
SEABOARD
COAST
F E C
FLORIDA
LEVEE
LEVEE
Windmill
T 38 S
T 39 S
Pumping St
19
25
30
36
31
32
6
5
4
BM 27
BM 30
BM 19
BM 27
BR 29
BR 20
BR 20
BR 27
20
25
15

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LEGEND:
- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- Fish and Wildlife
- Natural Area
- Waterway Corridor

NORTH MARTIN COUNTY
LAKE OKEECHOBEE

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 35 OF 52

CHANCY BAY LOCK AND RECREATION AREA
(STRUCTURE 135)
LEVEE 47 SECTION 2
LEVEE 47 SECTION 1
PROJECT BOUNDARY
SHORELINE
SHORELINE
LEVEE RIDGE CENTERLINE
LEVEE 47 SECTION 1
PROJECT BOUNDARY
Chancy Bay
LEVEE
SPOIL BANK
LEVEE
LEVEE
LEVEE
LEVEE
SPOIL BANK
Windmill
LEVEE
SPOIL BANK
Pumping Station
Pumping Sta
BM 20
COAST
FLORIDA
EAST
BR 25
BR 26
16
17
15
20
21
22
22
27
27
28
33
34
34

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LEGEND:
Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
Waterway Corridor

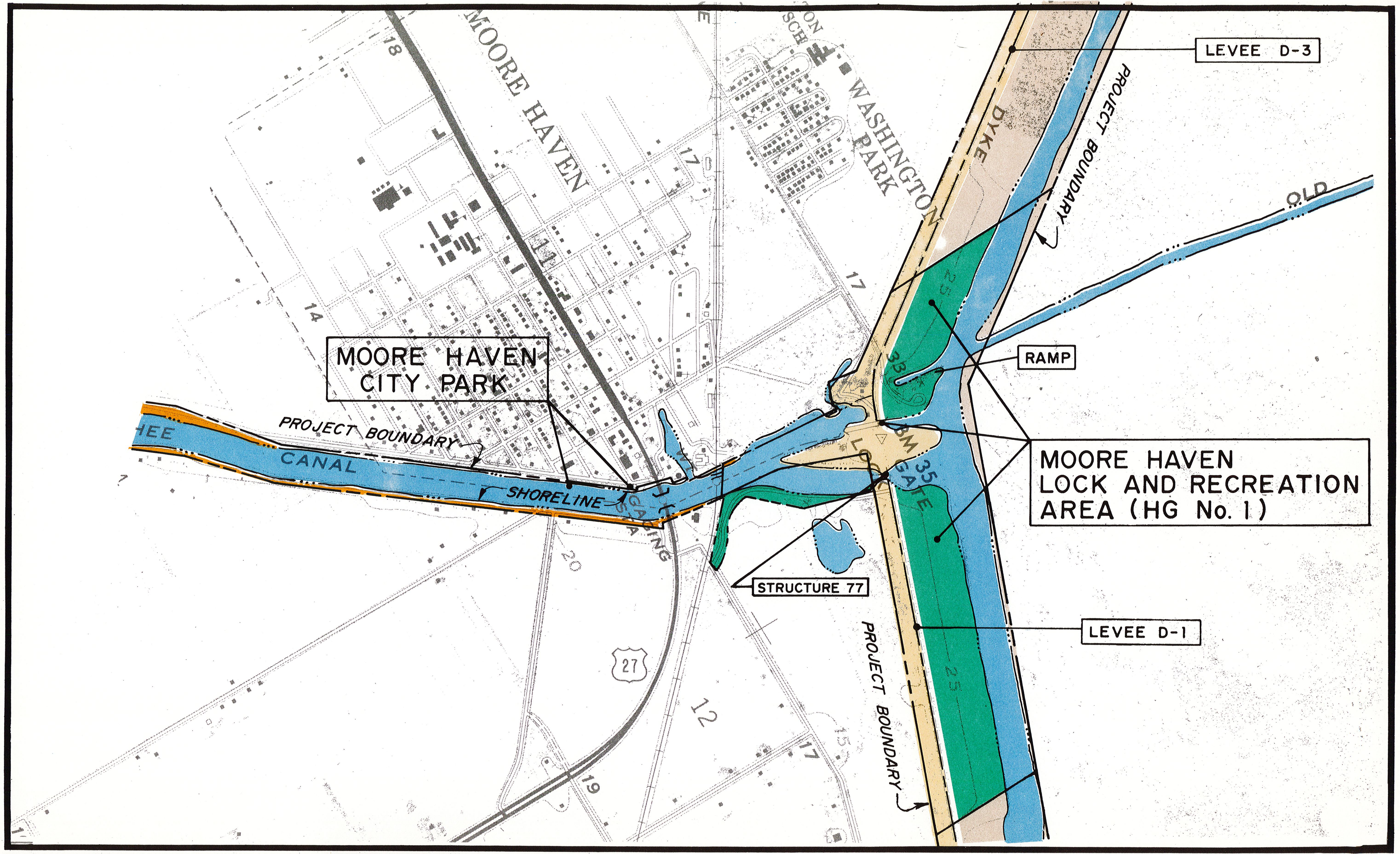
CHANCY BAY
LAKE OKEECHOBEE

N

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 36 OF 52


LEVEE D-3
PROJECT BOUNDARY
DYKE
WASHINGTON PARK
MOORE HAVEN
OLD
RAMP
MOORE HAVEN CITY PARK
PROJECT BOUNDARY
HEE
CANAL
SHORELINE
MOORE HAVEN LOCK AND RECREATION AREA (HG No. 1)
STRUCTURE 77
LEVEE D-1
PROJECT BOUNDARY
27
14
17
17
18
20
12
19
25
33
35
25
LOCK
GATE

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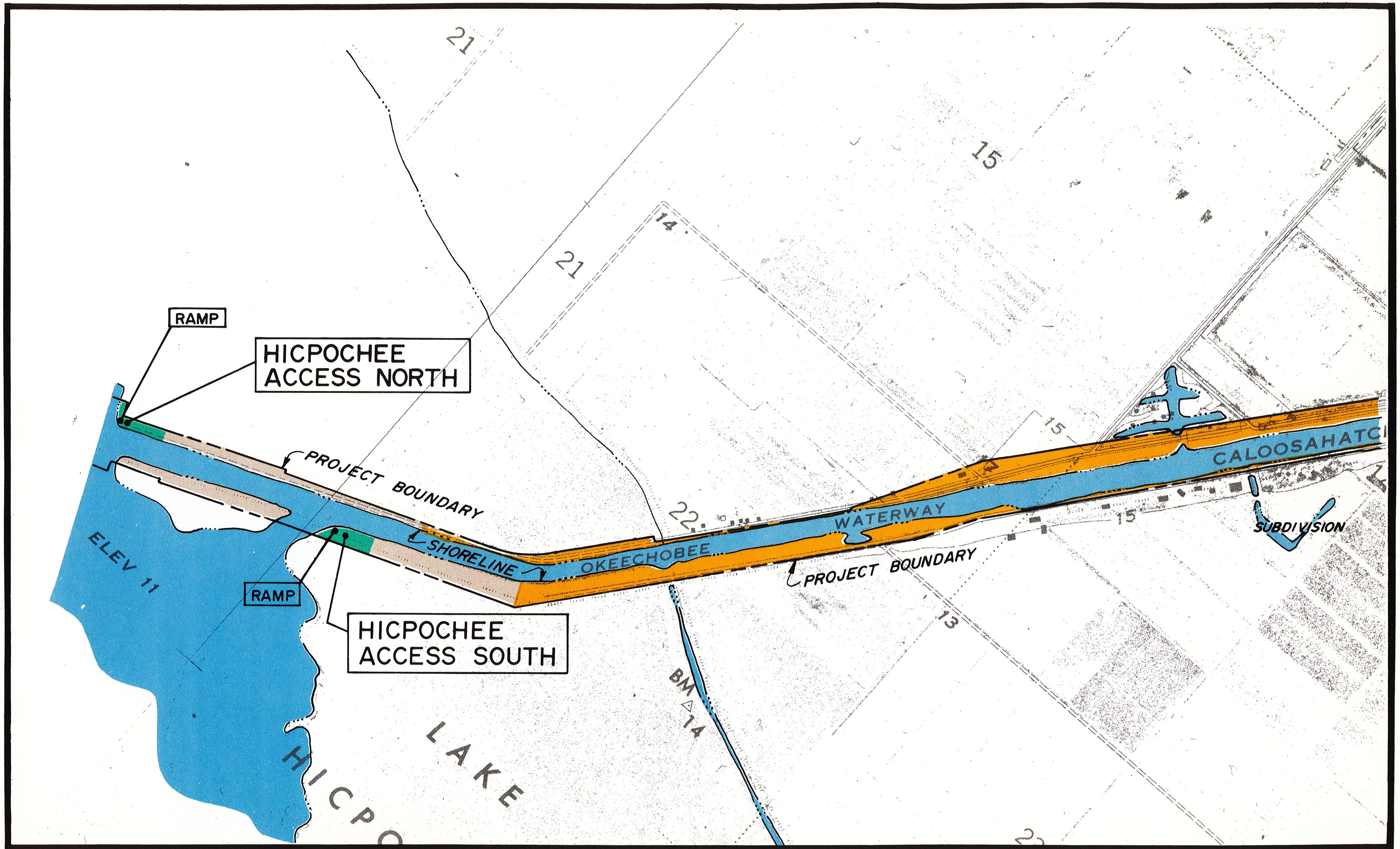
LEGEND:
🟦 Water/Marsh
🟨 Project Operation
🟩 Recreation
🟫 Fish and Wildlife
Natural Area
🟧 Waterway Corridor

MOORE HAVEN
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000
SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 37 OF 52


RAMP
HICPOCHEE ACCESS NORTH
PROJECT BOUNDARY
SHORELINE
ELEV 11
RAMP
HICPOCHEE ACCESS SOUTH
LAKE HICPO
OKEECHOBEE
WATERWAY
PROJECT BOUNDARY
CALOOSAHATC
SUBDIVISION
BM △ 14
21
21
15
14
15
22
15
13
23

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LEGEND:

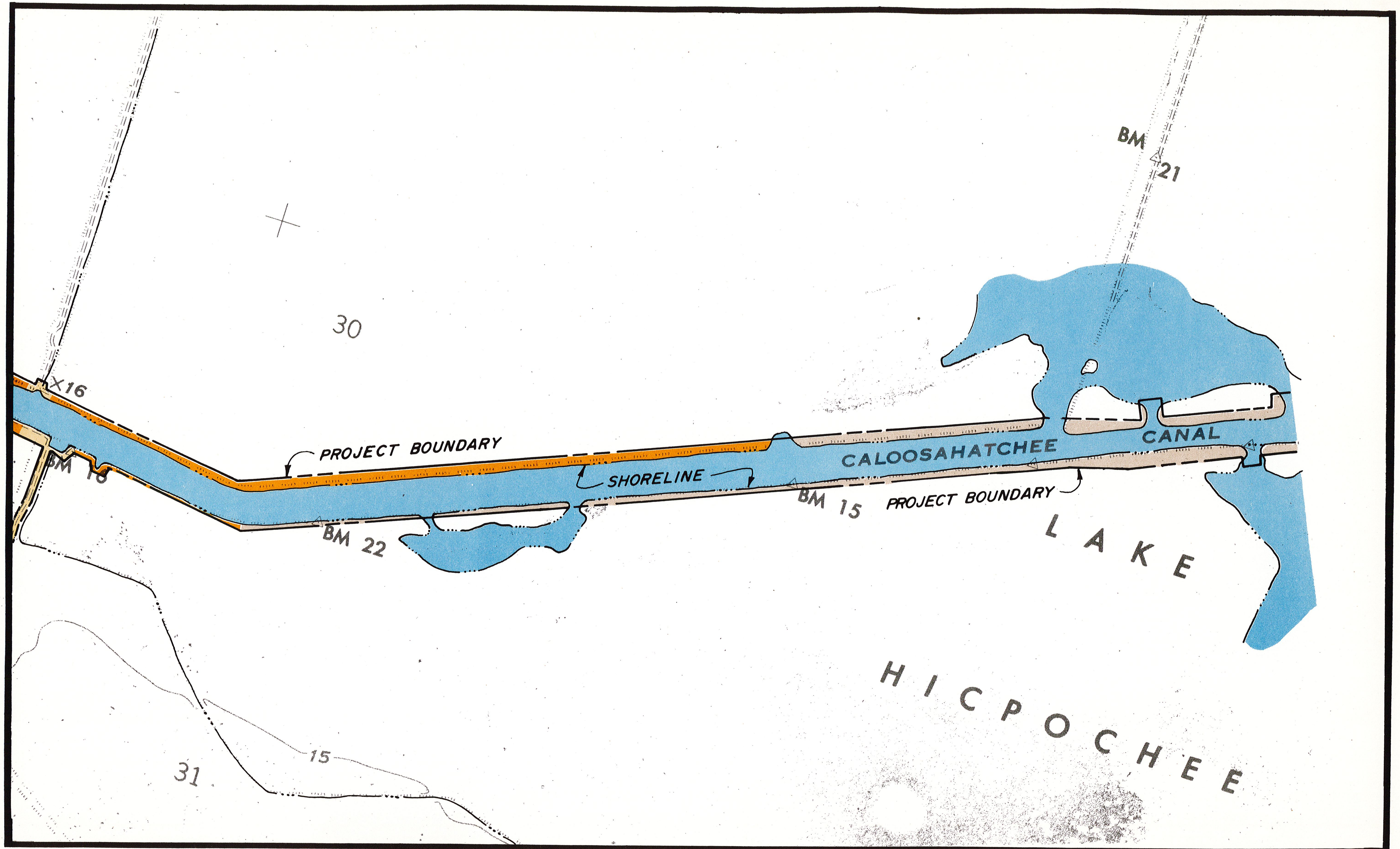
🟦 Water/Marsh
Project Operation
🟩 Recreation
🟫 Fish and Wildlife
Natural Area
🟧 Waterway Corridor

LAKE HICPOCHEE - EAST
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 38 OF 52


BM 21
30
X16
PROJECT BOUNDARY
SHORELINE
CALOOSAHATCHEE CANAL
BM 18
BM 22
BM 15
PROJECT BOUNDARY
LAKE HICPOCHEE
15
31

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LEGEND:

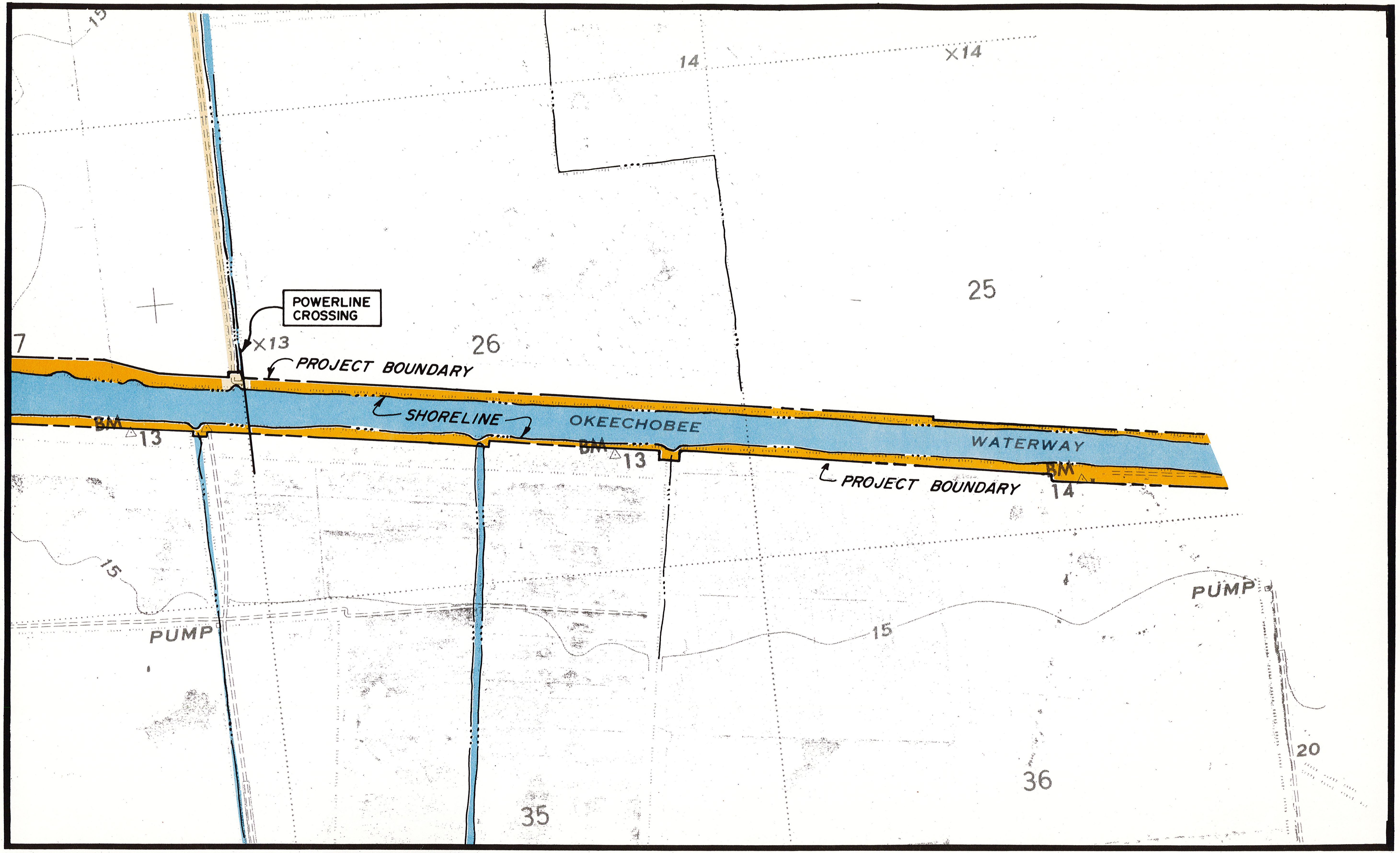
🟦	Water/Marsh
🟨	Project Operation Recreation
🟫	Fish and Wildlife Natural Area
🟧	Waterway Corridor

LAKE HICPOCHEE
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 39 OF 52


15
14
×14
25
26
7
POWERLINE CROSSING
×13
PROJECT BOUNDARY
SHORELINE
OKEECHOBEE
WATERWAY
BM
13
BM
13
BM
14
PROJECT BOUNDARY
15
PUMP
15
PUMP
20
35
36

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LEGEND:

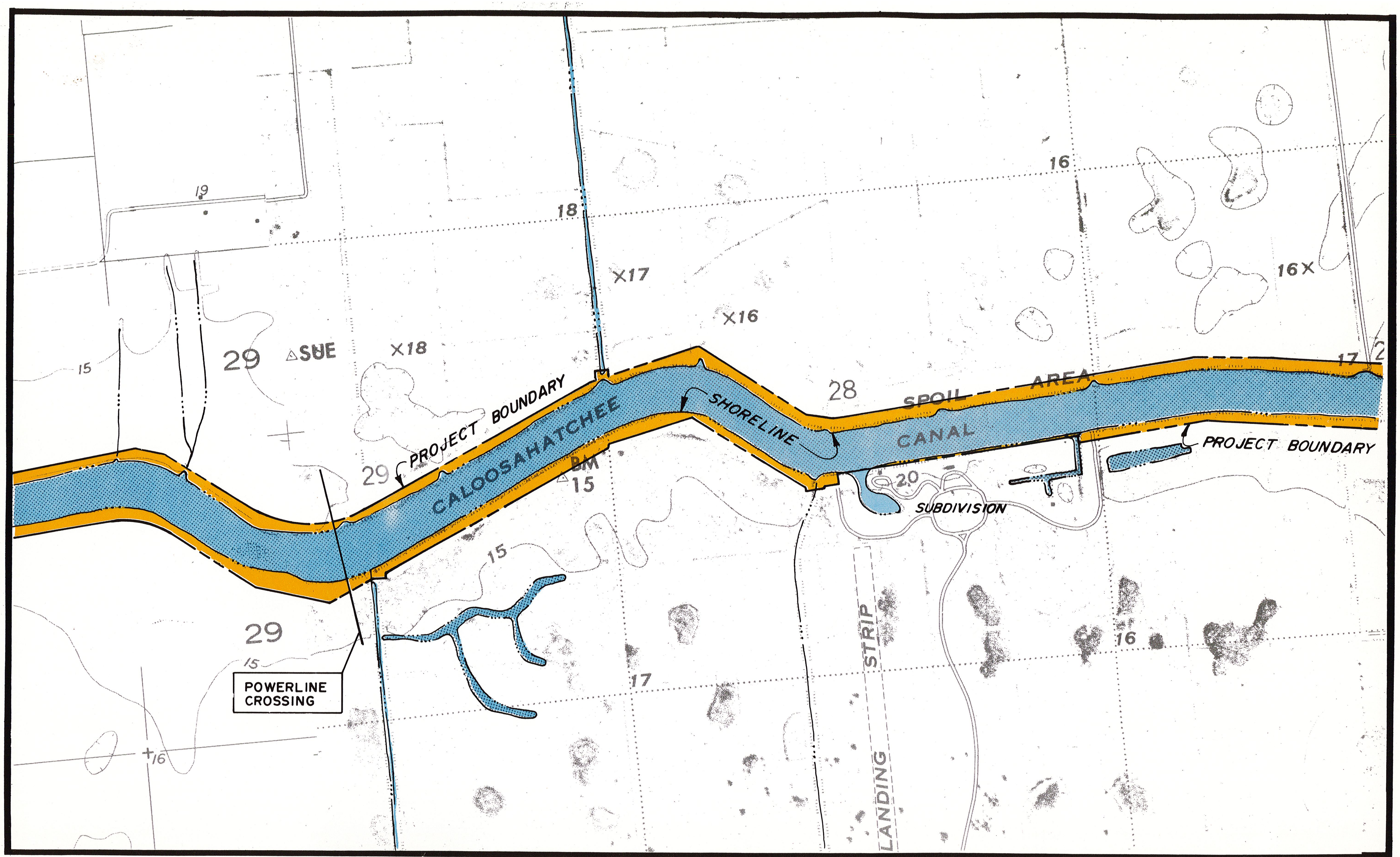
🟦	Water/Marsh
🟨	Project Operation
	Recreation
	Fish and Wildlife
	Natural Area
🟧	Waterway Corridor

LAKE HICPOCHEE - WEST
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 40 OF 52


19
18
X17
X16
16
16X
15
29
△SUE
X18
PROJECT BOUNDARY
29
CALOOSAHATCHEE
△BM
15
SHORELINE
28
SPOIL AREA
CANAL
17
2
PROJECT BOUNDARY
20
SUBDIVISION
15
29
15
POWERLINE
CROSSING
16
17
16
STRIP
LANDING

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Jacksonville District

LEGEND:

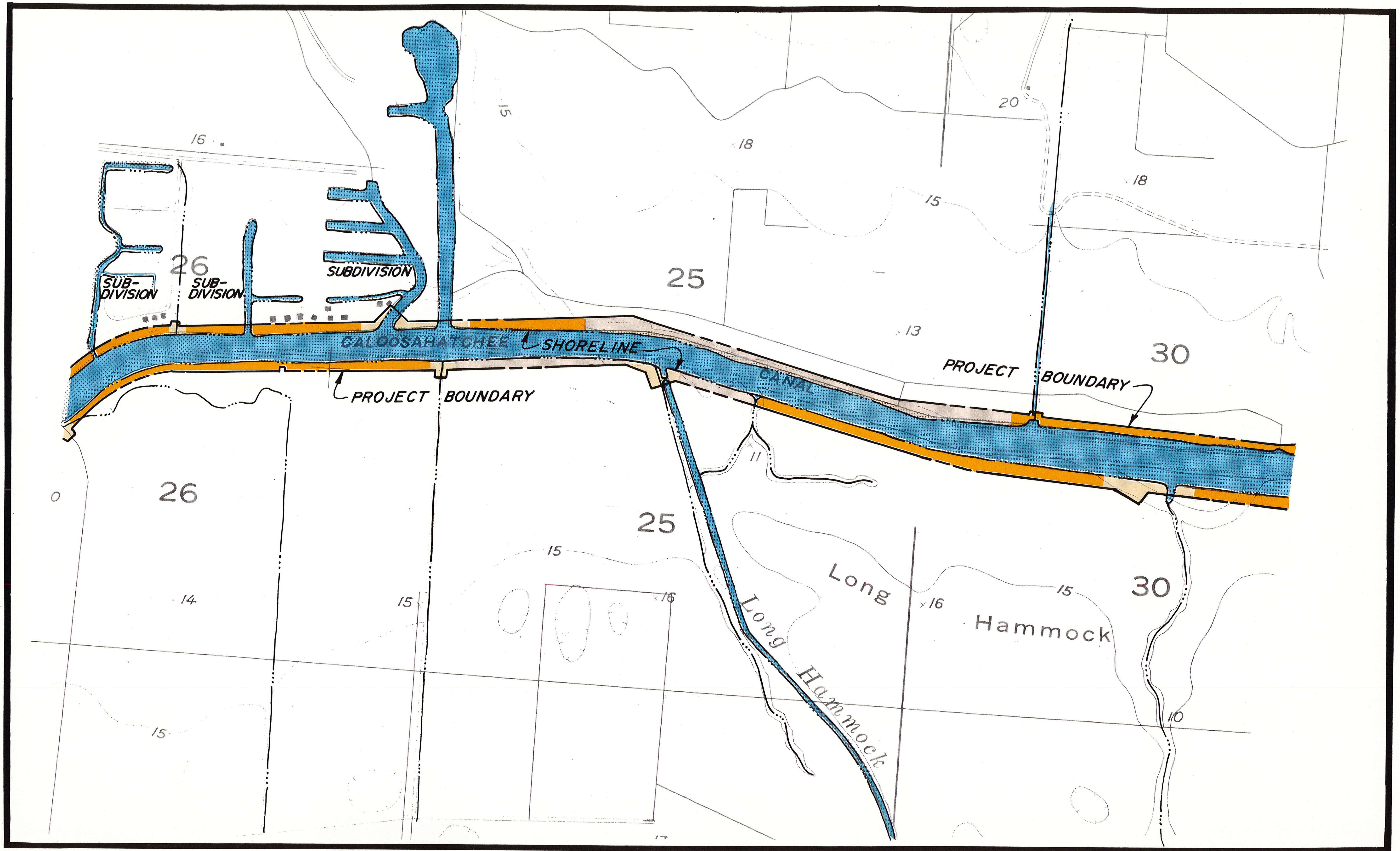
🟦 Water/Marsh
Project Operation
Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 41 OF 52


16
26
SUB-
DIVISION
SUB-
DIVISION
SUBDIVISION
15
18
20
18
15
25
13
30
CALOOSAHATCHEE
SHORELINE
CANAL
PROJECT
BOUNDARY
PROJECT
BOUNDARY
0
26
25
11
15
14
15
16
Long
Hammock
Long
Hammock
16
15
30
10
15

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LEGEND:

🟦 Water/Marsh
🟨 Project Operation
Recreation
⬜ Fish and Wildlife
Natural Area
🟧 Waterway Corridor

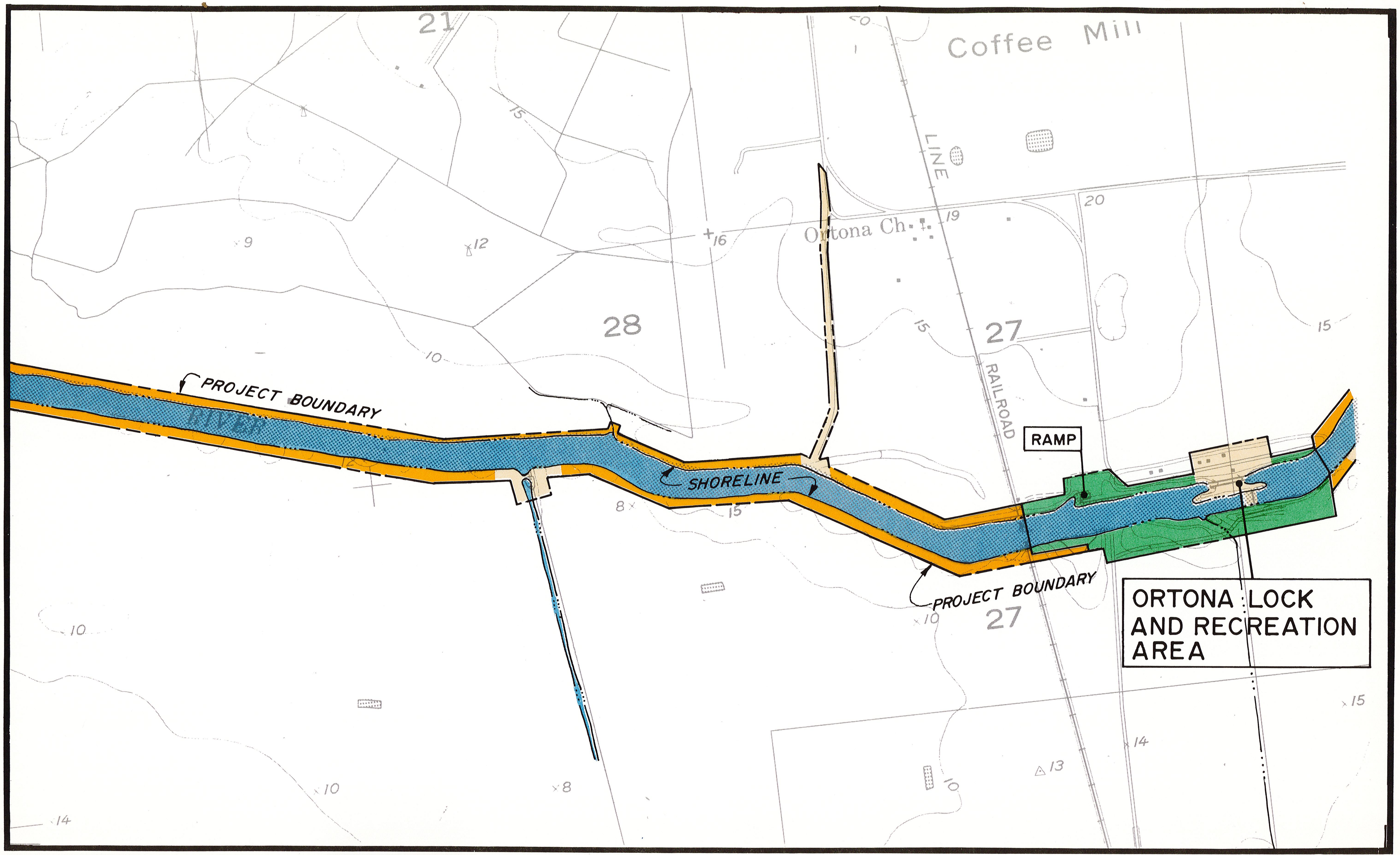
LONG HAMMOCK
CALOOSAHATCHEE RIVER

N

0 (FEET) 1000 2000 3000 SCALE

**LAND MANAGEMENT
CLASSIFICATION PLAN**

PLATE 42 OF 52


21
Coffee Mill
LINE
Ortona Ch.
19
20
16
9
12
28
27
15
10
RAILROAD
PROJECT BOUNDARY
RIVER
SHORELINE
RAMP
15
8
PROJECT BOUNDARY
27
10
ORTONA LOCK AND RECREATION AREA
15
14
13
10
8
10
14

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LEGEND:

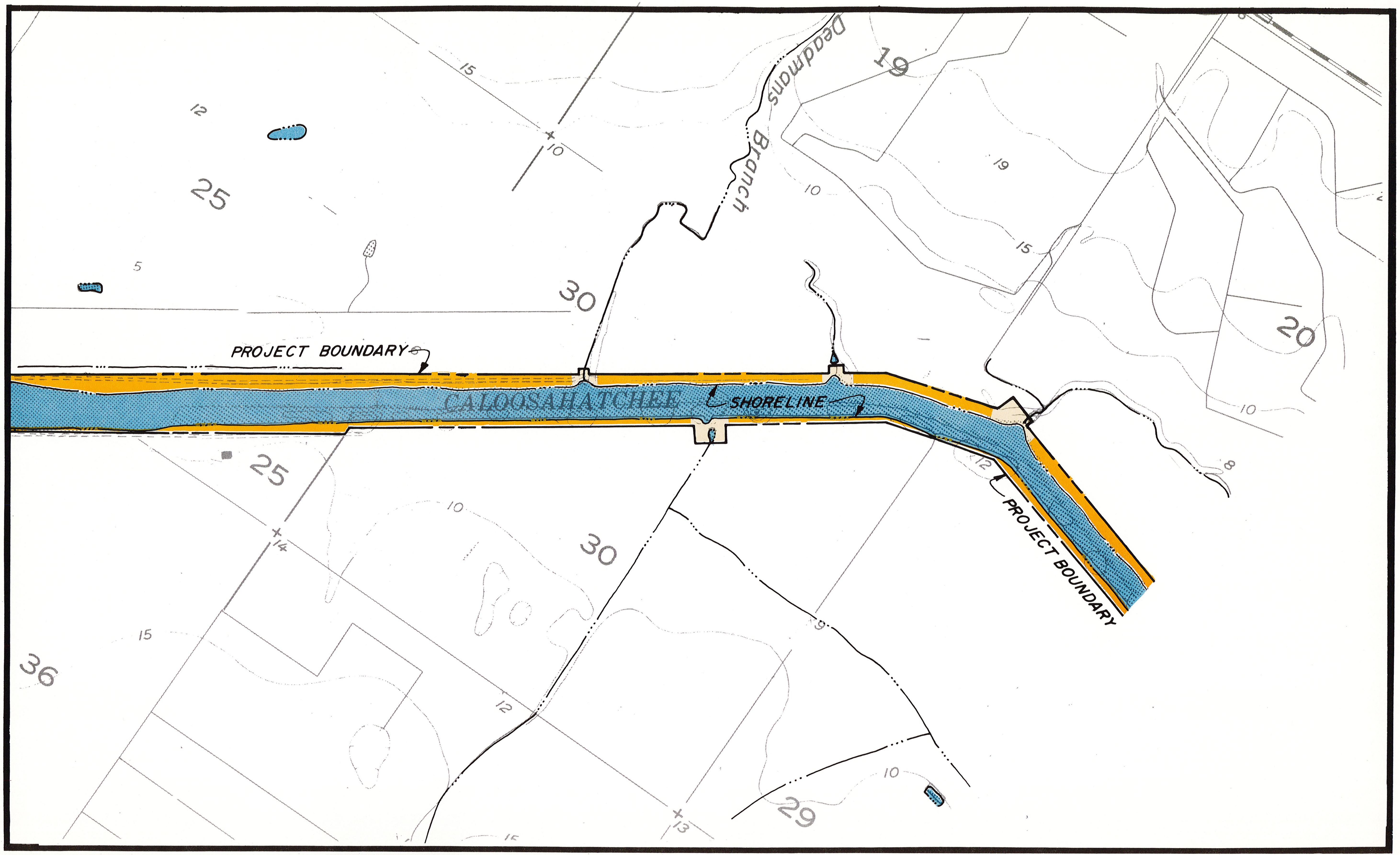
🟦 Water/Marsh
🟫 Project Operation
🟩 Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

ORTONA LOCK
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 43 OF 52


12
25
5
30
PROJECT BOUNDARY
CALOOSAHATCHEE
SHORELINE
Deadmans Branch
19
19
10
10
15
15
20
10
8
25
10
14
30
PROJECT BOUNDARY
12
15
36
12
9
10
29
13
15

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LEGEND:

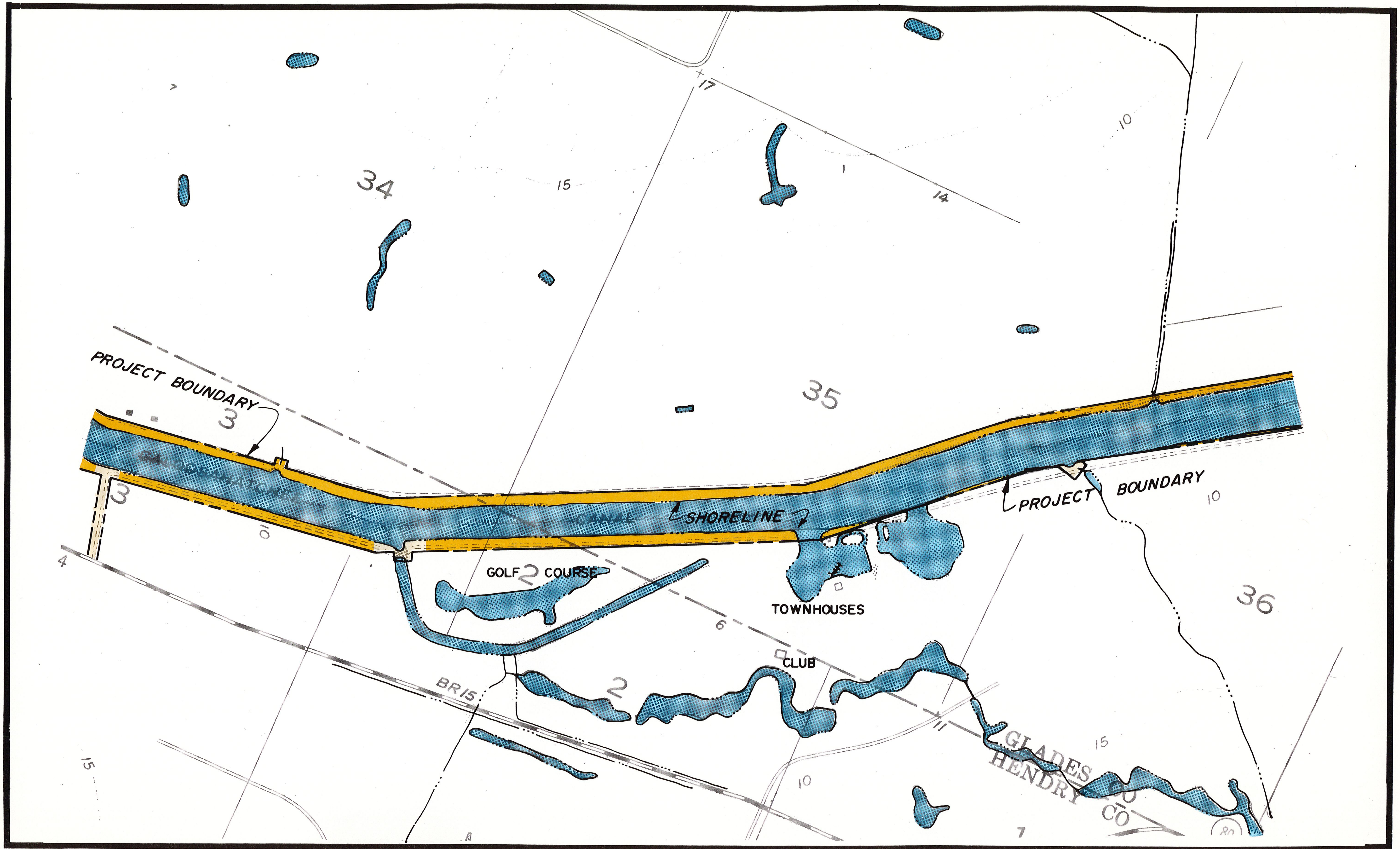
🟦 Water/Marsh
🟫 Project Operation
Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

DEADMANS BRANCH
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 44 OF 52


PROJECT BOUNDARY
3
34
15
17
10
1
14
35
3
CALOOSAHATCHEE
CANAL
SHORELINE
PROJECT BOUNDARY
10
4
GOLF 2 COURSE
TOWNHOUSES
36
6
CLUB
2
BR15
11
GLADES CO
HENDRY CO
15
15
10
7
80

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LEGEND:

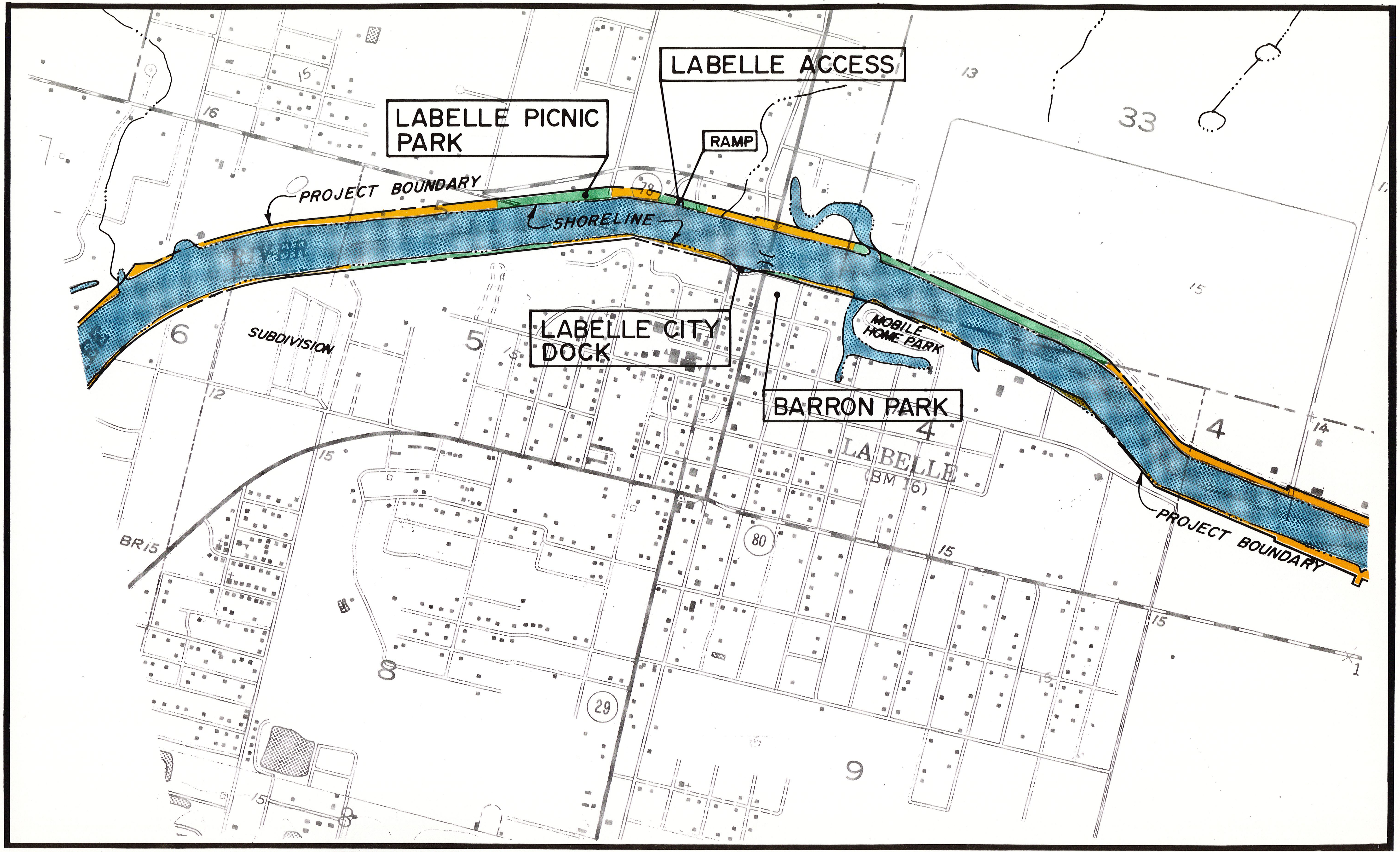
🟦 Water/Marsh
▨ Project Operation
Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

PORT LABELLE
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 45 OF 52


LABELLE ACCESS
LABELLE PICNIC PARK
RAMP
PROJECT BOUNDARY
SHORELINE
RIVER
LABELLE CITY DOCK
SUBDIVISION
MOBILE HOME PARK
BARRON PARK
LA BELLE
(BM 16)
PROJECT BOUNDARY
33
6
5
4
8
9
78
80
29
13
14
15
16
12
BR15

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LEGEND:

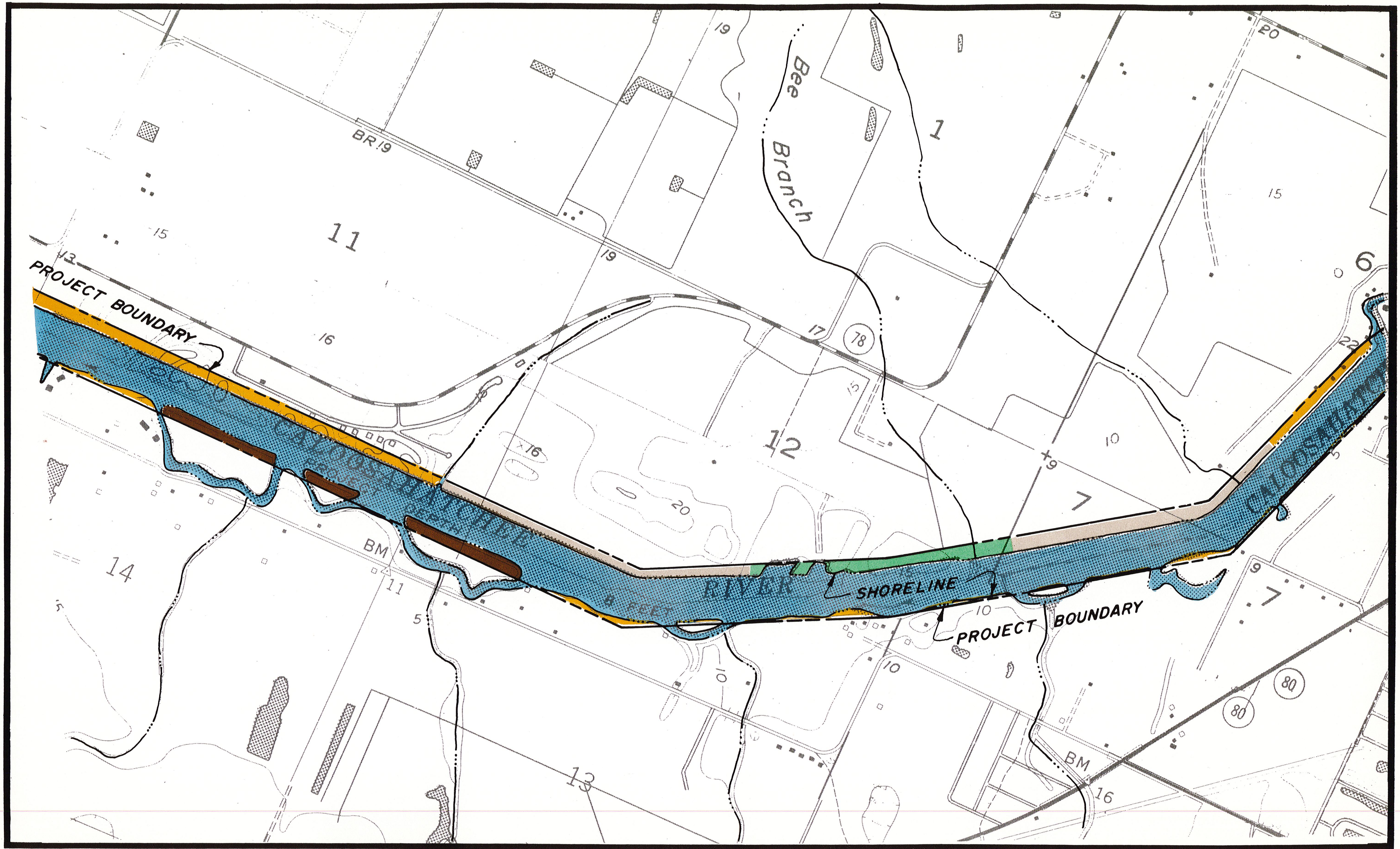
🟦	Water/Marsh
	Project Operation
🟩	Recreation
	Fish and Wildlife
	Natural Area
🟧	Waterway Corridor

LA BELLE
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 46 OF 52


Bee Branch
BR 19
11
12
1
6
7
14
13
78
80
BM
PROJECT BOUNDARY
CALOOSAHATCHEE
RIVER
PROJECT DEPTH
8 FEET
SHORELINE
PROJECT BOUNDARY
CALOOSAHATCHEE

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LEGEND:

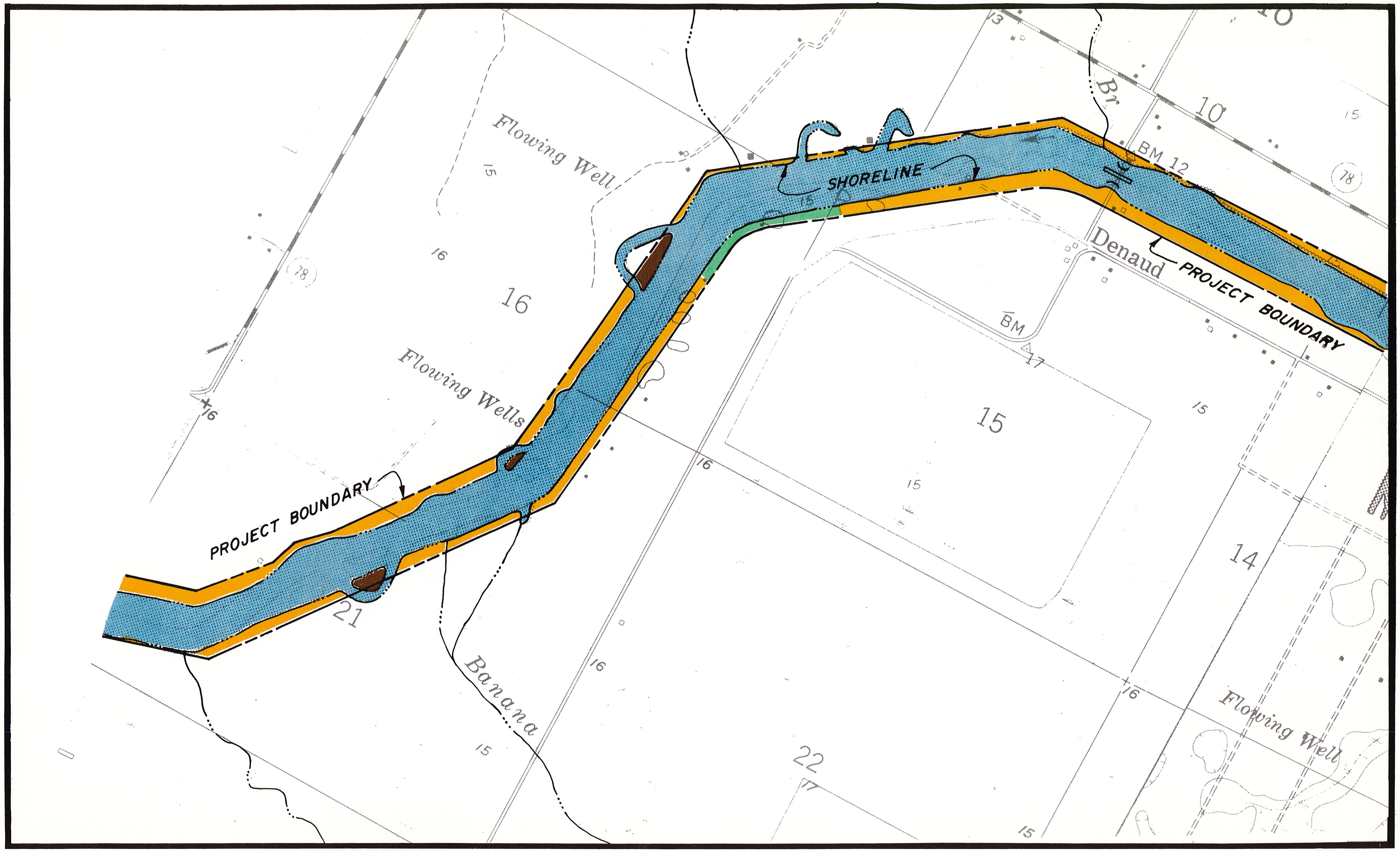
- 🟦 Water/Marsh
- Project Operation
- 🟩 Recreation
- ⬜ Fish and Wildlife
- 🟫 Natural Area
- 🟧 Waterway Corridor

BEE BRANCH
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000
SCALE

**LAND MANAGEMENT
CLASSIFICATION PLAN**

PLATE 47 OF 52


Flowing Well
Flowing Wells
Flowing Well
PROJECT BOUNDARY
PROJECT BOUNDARY
SHORELINE
Denaud
Br
BM 12
BM
17
Banana
16
15
14
10
21
22
78
78
16
15
16
15
15
16
16
15
17
13

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LEGEND:

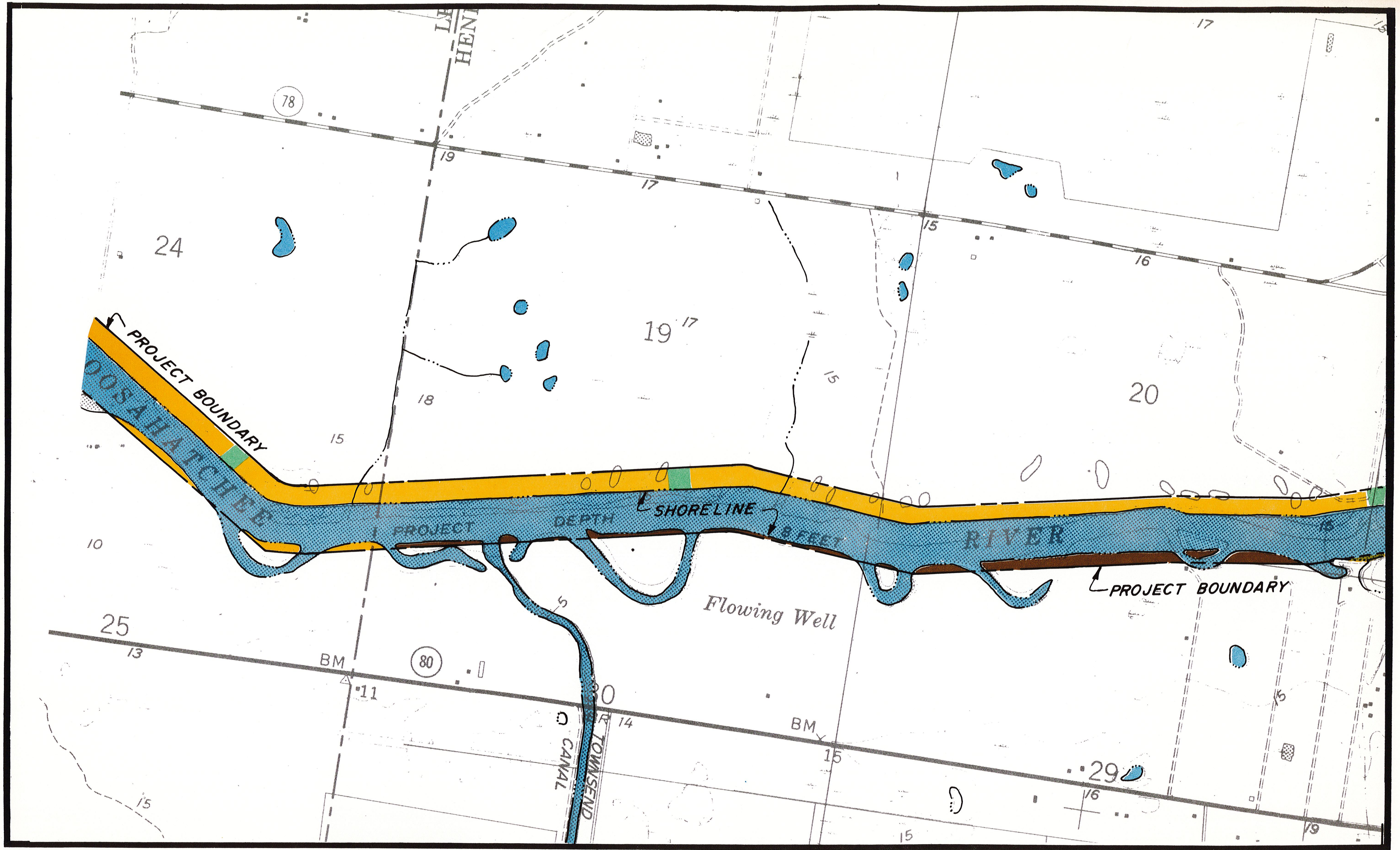
🟦	Water/Marsh
	Project Operation
🟩	Recreation
	Fish and Wildlife
🟫	Natural Area
🟧	Waterway Corridor

DENAVD
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 48 OF 52


LE
HEN
78
19
17
24
19
17
15
16
17
20
18
15
10
PROJECT BOUNDARY
OOSAHATCHEE
PROJECT
DEPTH
SHORELINE
8 FEET
RIVER
15
PROJECT BOUNDARY
Flowing Well
25
13
BM
80
11
30
14
TOWNSEND
CANAL
BM
15
29
16
15
15
19
5

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LEGEND:

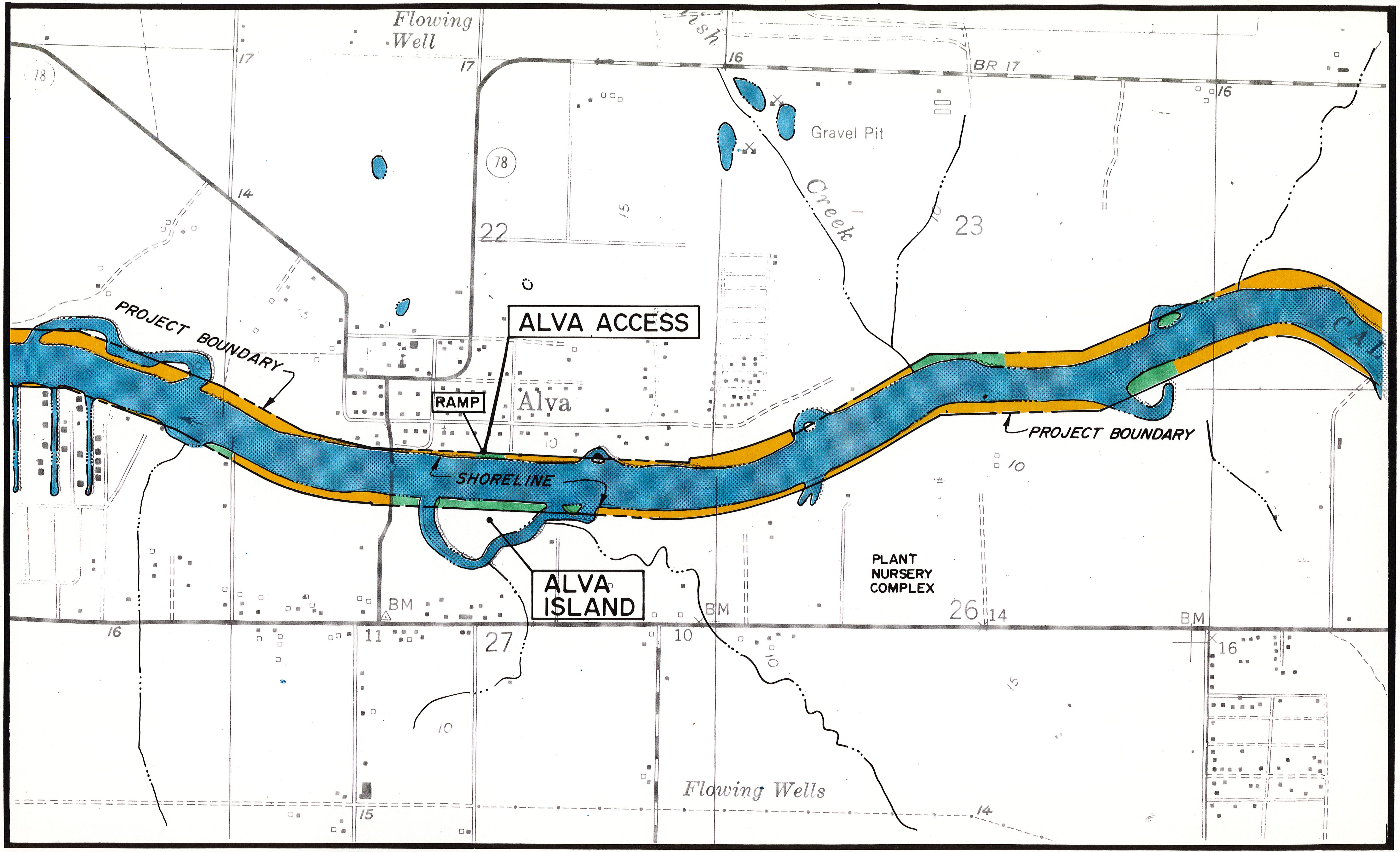
🟦 Water/Marsh
🟩 Project Operation Recreation
🟫 Fish and Wildlife Natural Area
🟧 Waterway Corridor

TOWNSEND CANAL
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 49 OF 52


Flowing Well
Fish
Gravel Pit
Creek
BR 17
78
78
17
17
16
16
14
15
22
23
ALVA ACCESS
RAMP
Alva
PROJECT BOUNDARY
PROJECT BOUNDARY
SHORELINE
ALVA ISLAND
PLANT NURSERY COMPLEX
CAL
BM
BM
BM
11
27
10
26
14
16
16
10
10
10
15
14
15
Flowing Wells

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LEGEND:

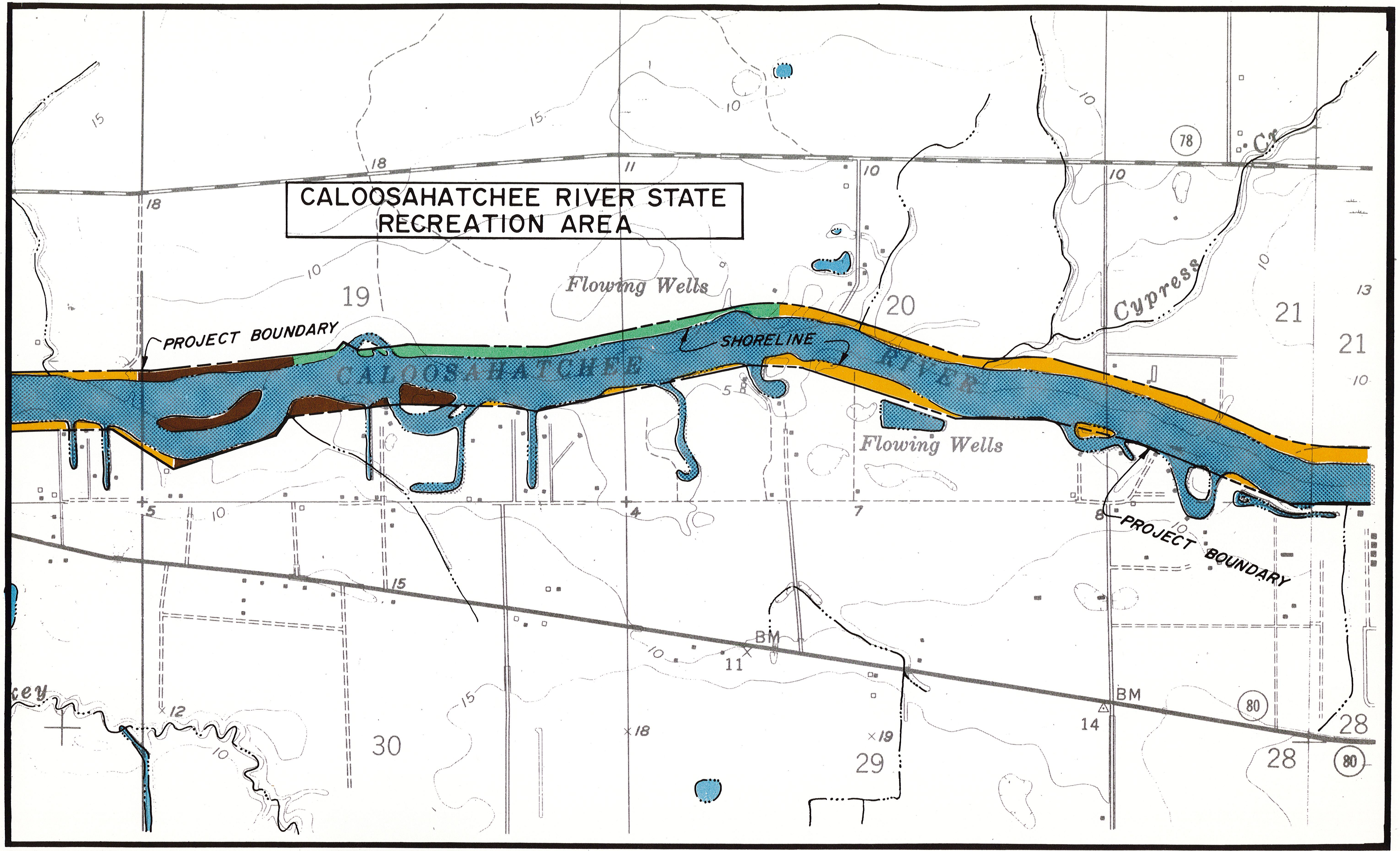
🟦 Water/Marsh
Project Operation
🟩 Recreation
Fish and Wildlife
Natural Area
🟧 Waterway Corridor

ALVA
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 50 OF 52


CALOOSAHATCHEE RIVER STATE RECREATION AREA
Flowing Wells
CALOOSAHATCHEE
RIVER
SHORELINE
PROJECT BOUNDARY
PROJECT BOUNDARY
Flowing Wells
Cypress
Cr
19
20
21
21
30
29
28
28
5
4
7
8
18
18
11
10
10
15
15
15
10
10
10
10
10
10
13
10
5
12
18
19
11
14
BM
BM
78
80
80
cey

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LEGEND:

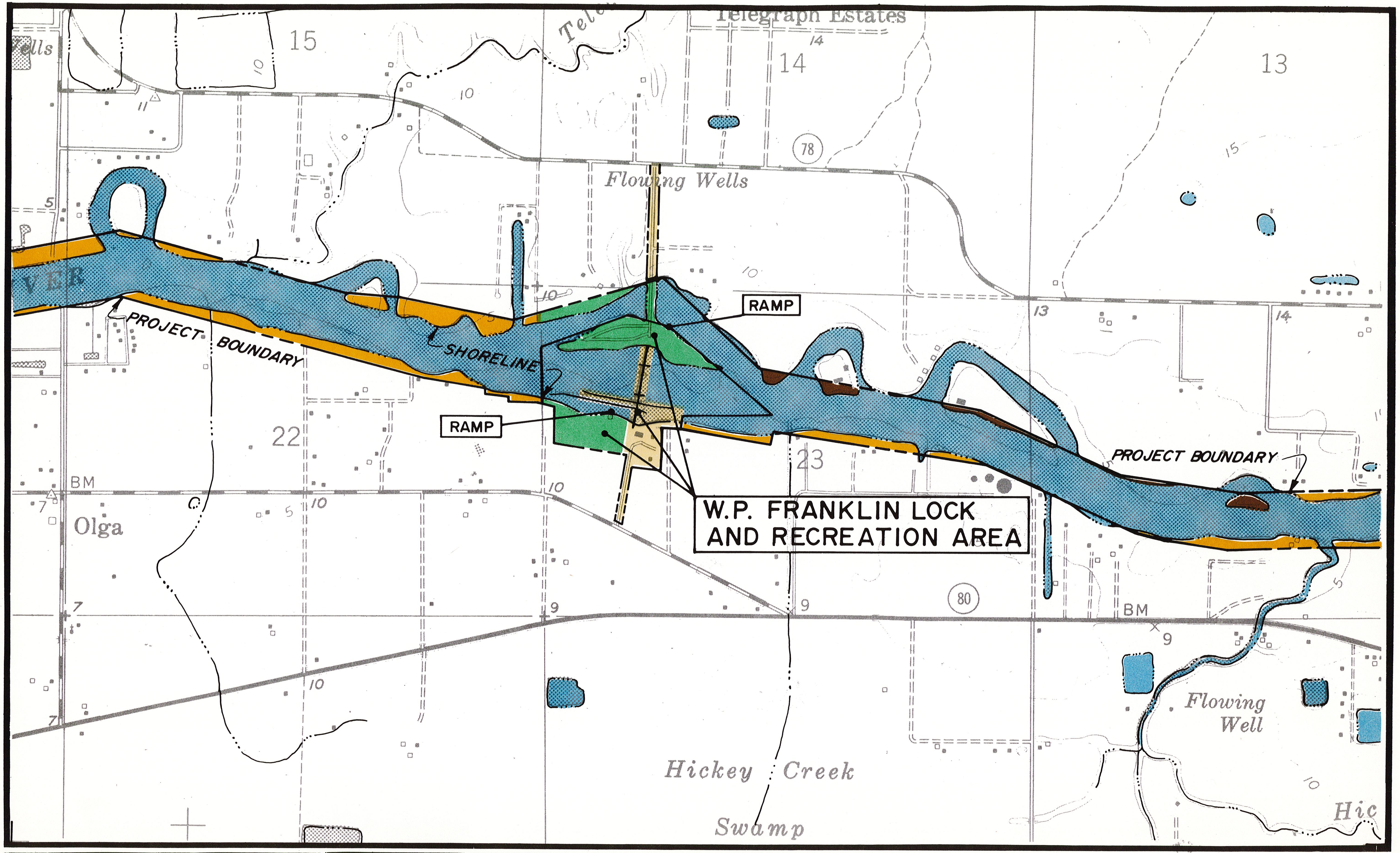
- 🟦 Water/Marsh
- Project Operation
- 🟩 Recreation
- Fish and Wildlife
- 🟫 Natural Area
- 🟧 Waterway Corridor

STATE RECREATION AREA
CALOOSAHATCHEE RIVER

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT CLASSIFICATION PLAN

PLATE 51 OF 52



Wells
15
Telegraph Estates
14
14
13
10
78
Flowing Wells
VER
PROJECT BOUNDARY
SHORELINE
RAMP
RAMP
22
23
13
14
15
W.P. FRANKLIN LOCK AND RECREATION AREA
PROJECT BOUNDARY
BM
Olga
10
9
9
80
BM
9
Flowing Well
Hickey Creek
Swamp
Hic

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers
Jacksonville District

LEGEND:

- 🟦 Water/Marsh
- 🟨 Project Operation
- 🟩 Recreation
- Fish and Wildlife
- 🟫 Natural Area
- 🟧 Waterway Corridor

W. P. FRANKLIN LOCK
CALOOSAHATCHEE RIVER

N

0 (FEET) 1000 2000 3000 SCALE

LAND MANAGEMENT
CLASSIFICATION PLAN

PLATE 52 OF 52

CHAPTER 10

CONCEPTUAL DEVELOPMENT PLANS

10-1 INTRODUCTION

10-1.1 The following plans represent attainable development where local cooperation has been indicated or where Corps-owned, operated and maintained sites are to be renovated. For Corps recreation areas at the St. Lucie, Moore Haven, Ortona and W.P. Franklin Lock and Dam sites, renovation, consolidation and the addition of revenue-producing facilities have been emphasized. For Phipps Park, Port Mayaca, Okeechobee Park, and the Caloosahatchee River State Park, plans have been coordinated with local sponsors who have indicated an interest to cost share in their future development. Some facilities not elegible for cost sharing may be provided by the sponsor. For the remaining recreation areas on the project, three typical site plans are provided as a guide to future development with a potential sponsor.

10-2 ST. LUCIE RECREATION AREA

Plate 1 of 10

10-2.1 General Description.

The site consists of about 155 acres owned by the Corps. It is divided into two parcels by the St. Lucie Canal. On the south bank there are about 34 acres accessible from SR 76 via a paved road. These have been developed as a camping/day-use area and an office for resource management activities. On the north bank there are about 121 acres accessible by foot over the lock. The north bank is developed with several tables, a picnic shelter, fishing pier, and a 1.5 mile self-guided trail. It is also used for primitive camping.

10-2.2 Site Analysis.

The site has several scenic vistas of the Canal. The 1920's lock and a more recent powerhouse remain as part of the newer structure. Steep canal banks restrict development of swimming areas. Fishing opportunities are good near the spillway.

The south bank is narrow with limited land area and adjacent to Martin County's Phipps Park. The 9-site campground is used to capacity during the winter months. There are several mature trees providing beneficial shade.

The north bank has vegetation in the early stages of succession, and a creek flows through its western section. There is no vehicular access, however Martin County owns a 60-foot right of way for this purpose. A small parcel on the east end is separated from the main site by private property; see Plate 2 of 10 for location of the boundary line.

10-2.3 Design Objectives.

A. South bank:

(1) Convert the area to day use and provide interpretive and additional picnic and group facilities.

(2) Coordinate and connect the site's development with Phipps Park.

B. North bank:

(1) Develop additional campsites with support facilities.

(2) Provide separate day-use areas.

(3) Coordinate with Martin County to provide an access road to the site.

10-2.4 Proposed Facilities.

A. The site:

(1) Fence the reservation boundary.

(2) Provide additional trees and landscaping.

(3) Convert the old powerhouse to house interpretive displays about the C&SF project.

B. South area:

(1) Renovate the existing play area, signs, washhouse, group shelter and launching ramp.

(2) Enlarge the boat trailer/car parking area. Provide docking and fishing piers for users arriving by boat and for shoreline fishing.

(3) Remove the campsites and provide additional picnic units, group shelters, sanitary facilities, and parking areas throughout the site. This includes the area where the lock master's residences are to be removed.

(4) Install a trail system and connect the site with Phipps Park.

C. North area:

(1) Provide a public launching ramp upstream and downstream of the lock with parking, restrooms, and docks.

(2) Provide group picnic areas with shelters, tables, restrooms, play areas, and parking.

(3) Provide nature and pedestrian trails and connect day-use areas with parking.

(4) Develop campsites with impact areas, tables, utility hookups, sanitary facilities, parking, play areas, and group areas with assembly shelters.

(5) Provide fishing piers and fish-cleaning stations.

(6) Provide separate entrances and fencing between camping and day-use areas. Provide control station, gate, camper turnaround, and park attendant sites.

(7) Acquire an easement for a shoreline trail to the Government land located on the east end of the site.

10-3 PHIPPS PARK

Plate 2 of 10

10-3.1 GENERAL DESCRIPTION.

The site consists of about 127 acres. It is accessible from SR 76 via a paved road, contiguous to the St. Lucie Canal and adjacent to the Corps' St. Lucie Recreation Area. It is operated and maintained by Martin County and has limited development for camping, picnicking and boat launching.

10-3.2 SITE ANALYSIS.

The site affords scenic vistas and has an attractive, park-like setting with large, open, grassed areas and scattered, mature trees. Steep banks on the St. Lucie Canal are unsightly due to erosion and toppling vegetation. The unstable banks present a safety hazard and restrict access to the water. A small cove on the northern end of the site has gradually sloping banks permitting safe access to the water. Depths are too shallow for most boats at the launching ramp. The site is serviced by well water and uses septic field systems for waste disposal.

10-3.3 DESIGN OBJECTIVES.

A. Renovate existing camping facilities.

B. Enhance day-use activities by renovating and providing additional facilities for individuals and special groups.

10-3.4 PROPOSED FACILITIES.

A. Develop campsites with impact areas, electrical service, a sanitary dump station, play areas, visitor parking, and improved washhouses. Provide landscaping for screening between campsites and separation from day-use areas.

B. Provide picnic area with restrooms, tables, group shelters, and play equipment.

C. Develop trails, for hiking and bicycles, and connect with the St. Lucie Recreation Area.

D. Develop a nature trail for self-guided interpretation.

E. Upgrade boat launching facilities and provide docks, a fish-cleaning station, and adequate water depths.

F. Provide an open field to accommodate group functions.

G. Install a pier for fishing and a dock to provide access to the park for boat traffic.

H. Provide support facilities, an entrance station, and paved roadways and parking.

10-4 PORT MAYACA RECREATION AREA

Plate 3 of 10

10-4.1 General Description.

The Corps owns 41 acres of land, principally for the lock and dam, and has easement rights to 214 acres. The site is located west of U.S. 441, and is divided into two parcels by the St. Lucie Canal. Access to the site is via an asphalt road from U.S. 441 to the north bank and from SR 76 to the south bank.

10-4.2 Site Analysis.

The site does not have any developed recreation facilities; however, people launch boats from three dirt ramps, park vehicles on levee berms, and fish inside the basin near the spillway. The Lake's shoreline is being protected by the shoreline revetment program. The site is without trees, since it is part of the levee system, and affords unobstructed views of the Lake. The Florida Trail Association uses the top of the levee for part of their trail system.

10-4.3 Design Objectives.

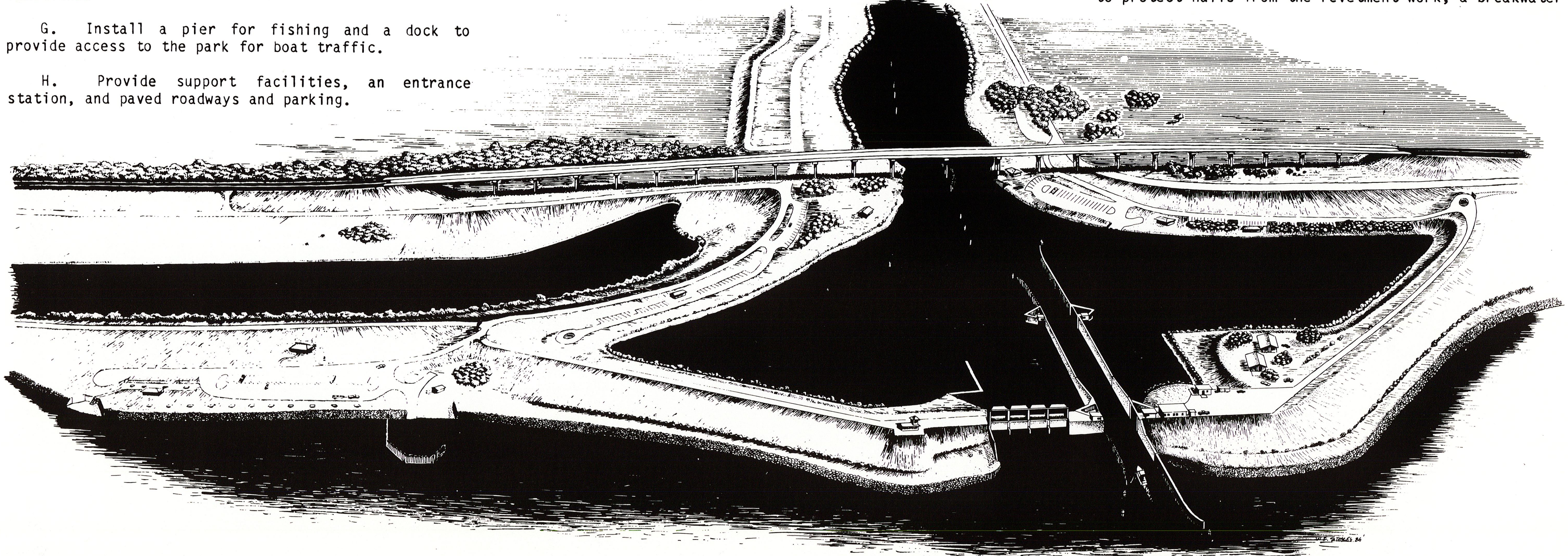
A. Develop the site for day-use (SFWMD, the sponsor, has approved most of the general development plan and it is anticipated that a portion of the north side will be constructed in 1986/87).

B. Construct additional day-use facilities as funding becomes available.

10-4.4 Proposed Facilities.

A. Provide restrooms, picnic shelters, boat launching ramps, picnic tables, area signs, parking and landscaping, as approved by SFWMD.

B. Provide additional facilities consisting of an interpretive/overlook structure, a boat beaching area to protect hulls from the revetment work, a breakwater



Artist Conception of Proposed Facilities at Port Mayaca Recreation Area for ramp users, pedestrian access over the revetment to the shoreline, fishing pier, fish-cleaning station, and trail to the old lock structure near the DOT Roadside Park.

C. Provide trees and landscaping.

D. Upgrade top of the levee for trail use and provide direction markers and interpretive kiosk.

10-5 OKEECHOBEE PARK

Plate 4 of 10

10-5.1 GENERAL DESCRIPTION.

The site consists of about 10 acres of easement lands in Okeechobee County near the town of Okeechobee. It is accessible from SR 441 via an unpaved road over the Herbert Hoover Dike. The site is located on the north shore of Lake Okeechobee, and is operated by Okeechobee County. The site has picnicking facilities, a large dirt parking area, a fishing pier, beach, and a boat launching area.

10-5.2 SITE ANALYSIS.

The site is located on one of the few broad, flat sandy areas lakeward of the dike and affords unobstructed views of the Lake. It is fairly open with scattered palms in the picnic area and a dense stand of Australian pines in the boat launching area. The shoreline permits easy access to the water. Existing access roads and parking areas are not paved. Flooding occurs on the road to the launching area when lake levels exceed their normal range. The site is without electricty, potable water, and sanitary facilities.

10-5.3 DESIGN OBJECTIVES.

A. Enhance day-use by upgrading the existing park and providing additional facilities.

10-5.4 PROPOSED FACILITIES.

A. Improve the boat launching area by enlarging to three lanes and adding docks and restrooms. Dredging the boat basin will be required for adequate maneuvering. Security lighting will be provided.

B. Relocate the road to the boat launching area to prevent flooding.

C. Enlarge the swimming beach and provide restrooms and a changehouse. This may be established as a concession.

D. Locate docking facilities and a small boat rental operation on the fishing pier. This may be established as a concession.

E. Provide a nature trail and observation tower on Eagle Bay. Elevated boardwalks should extend through low areas.

F. Provide a shoreline fishing trail. Boardwalks may be required to permit access to the boat canal west of the boat launching area.

G. Provide group picnic shelters.

H. Provide trees and landscaping.

10-6 MOORE HAVEN RECREATION AREA

Plates 5 and 6 of 10

10-6.1 General Description.

The site consists of 150 acres of Corps-owned land and 39 acres of easement land. The Caloosahatchee River divides the site into the west and east areas. There is a central island between the lock and the spillway. Access to the site is from U.S. Highway 27 via local roads on each side of the Caloosahatchee River.

A major portion of the site west of the lock is under a concession lease as a small marina and campground. A boat ramp constructed by the Corps is maintained by the concessionaire and free to the public. The site east of the spillway has a fishing pier and dirt parking area. The central island does not have any existing public-use facilities.

10-6.2 Site Analysis.

The west area is located on a wide portion of the berm on the Rim Canal. There are trees around the lock master's residence and the boat basin. The east area is located on a wide portion of the berm. Most of the site is above 24 feet NGVD and without trees. The fishing pier and parking area are located landward of the dike. A paved access road extends to the top of the dike and provides access across the spillway to the central island. The island, an open grassed area, can also be reached by foot across the closed lock gates.

The site offers scenic views of the Lake and Waterway. Proximity of the shoreline to the Rim Canal and project structure prohibit swimming activities. The preferred route of the Florida Trail has been established in this area.

10-6.3 Design Objectives.

A. Continue concessionaire's activities in the west area.

B. Provide interpretive facilities about the C&SF Project.

C. Develop day-use facilities on the central island and east area.

10-6.4 Proposed Facilities.

A. West area:

(1) Convert the lock master's residence into an area office for resource management activities.

(2) Provide interpretive displays about the C&SF Project.

(3) Provide trees and landscaping.

B. Central Island:

(1) Provide a picnic shelter, tables, and parking for the area north of the levee.

(2) Provide a picnic shelter, tables, fishing pier, parking, trails and landscaping south of the levee.

C. East area:

(1) Provide a fish-cleaning station near the spillway and existing pier.

(2) Develop group picnic areas with shelters, tables, restrooms, play areas, multi-purpose playfields, fishing piers and parking.

(3) Provide a public boat launching ramp with docks, boat beach and parking area.

(4) Provide interpretive facilities consisting of observation platforms, pedestrian trails, an amphitheater and an assembly building with meeting rooms, displays and restrooms.

(5) Provide trees and landscaping.

D. Levee:

(1) Upgrade the top of the levee for trail use and provide direction markers and interpretive kisok.

10-7 ORTONA RECREATION AREA

Plate 7 of 10

10-7.1 General Description.

The site consists of 66 acres of Corps land. It is long, narrow and divided by the Caloosahatchee River. The north bank, which is partially developed, is accessible via a paved road off SR 78. West of the entrance road there are picnic tables (also used as free campsites), a boat launching ramp with limited parking, a washhouse, fishing pier, two small picnic shelters and swings. To the east is the lock master's office and residences. A central island between the lock and the spillway is accessible from both structures. The south bank is the larger parcel and accessible via a dirt road off SR 80. Part of the area is developed as a campground with a washhouse and park attendant. Fishing piers are located on each bank downstream of the spillway.

10-7.2 Site Analysis.

The north area presents an attractive setting with several mature trees both in the recreation and lock operations areas. The existing recreation facilities are crowded and overused. The south area is divided by a drainage canal with an existing traffic bridge. Except for the southeast boundary, the site is without trees, which is of particular concern in the existing campground. Two right of ways for access into the site are being negotiated. The project structures and the steep shoreline along the River restricts safe swimming activities.

10-7.3 Design Objectives.

A. North area:

(1) Renovate existing facilities and provide for additonal day-use activities including individual and group use and visiting the lock complex.

B. South area:

(1) Develop water access for boating and fishing.

(2) Renovate existing campsites, and provide additional facilities.

10-7.4 Proposed Facilities.

A. The site:

(1) Provide shade trees and landscaping.

(2) Fence the reservation boundary.

B. North area:

(1) Improve the boat ramp parking and traffic pattern.

(2) Provide picnic areas, group shelters, sanitary facilities, fishing piers and parking near the lock operations area.

(3) Install observation platforms at both ends of the site and construct a trail connecting them to the lock, piers, and picnic areas.

C. South area:

(1) Redevelop the campground using the entire area and provide additional sites, tables, utility hookups, sanitary facilities, parking, play areas, control station, gate, and park attendants' sites.

(2) Install an observation platform on the west end and construct a trail connecting it to the fishing piers and parking areas.

(3) Provide a boat ramp and parking with a separate entrance from the campground.

10-8 CALOOSAHATCHEE RIVER STATE PARK

Plates 8 and 9 of 10

10-8.1 GENERAL DESCRIPTION.

The site consists of about 718 acres in Lee County on the north bank of the Caloosahatchee River. It is accessible from SR 78 which crosses through the site. The site consists of undeveloped woodland and abandoned pasture south of SR 78 and a reverting spoil area north of SR 78.

10-8.2 SITE ANALYSIS.

The area to be developed is south of SR 78 and woodlands cover most of this site. Frontage on the Caloosahatchee River offers good opportunities for water-related recreation. Fishing and boating are popular on this portion of the Caloosahatchee River. Aside from Corps-maintained facilities at the W.P. Franklin Lock and Dam, there are no known park lands in the general area.

10-8.3 DESIGN OBJECTIVES.

A. Develop a regional recreation facility for public participation in water related activities such as boating, fishing, picnicking, camping, nature study and swimming.

B. Maintain design standards that blend with the natural environment and allow activites in a relaxed outdoor atmosphere.

10-8.4 PROPOSED FACILITIES.

A. Develop a boat and canoe launching area with docks for boat loading and unloading, for visitors arriving by boat, and for limited fishing. The area should have a boat beach, picnicking facilities, restrooms, and lighting as needed.

B. Develop a picnic area for groups and individuals near the river. The area should have restrooms, picnic shelters with water and electricity, and picnic tables and grills. Depending on the water quality of the River, a swimmer's beach could be located in this area.

C. Develop a camping area with quick access to the River. Campsites should include water and electrical service, central washhouses, and a sanitary dump station. By keeping the camping area a short distance from the water's edge, campers can still enjoy the River without adversely affecting it.

D. Develop a youth camp for environmental education programs and group meetings. Sections of this property are suited for environmental education and nature study because of the diverse ecosystems.

E. Develop a play area near the picnic area with easy access to the camping area.

F. Develop hiking trails to extend through the site's natural areas. Elevated boardwalks may be needed to provide access through low areas.

G. Develop support facilities, an entrance station, paved roadways and parking.

10-9 W.P. FRANKLIN RECREATION AREA

Plate 10 of 10

10-9.1 General Description.

The site is 57 acres of Corps land and six acres of easement land. It is divided into two areas by the Caloosahatchee River. The south area is used for day use with a beach, picnicking, boat ramp, washhouse, and parking. It is accessible from SR 80 via a paved roadway. The area contains the lock master's residences and office, which serves as an area office for resource management. The north area has a campground with a washhouse and boat launching facilities serving both day users and campers. The area is accessible via a paved road from SR 78.

10-9.2 Site Analysis.

The south area is adjacent to land owned by SFWMD. The north area is an island between the old river channel and the spillway and has an unobstructed view up and down the river. Fishing is reported to be good downstream of the spillway and fishermen are using the spillway abutment as a pier.

10-9.3 Design Objectives.

A. South area:

(1) Renovate existing facilities,

(2) Plan facilities that would be compatible with future development of land owned by SFWMD.

(3) Develop a boat launching area upstream of the lock where the lock master's residences are to be removed.

B. North Area:

(1) Renovate existing facilities.

10-9.4 Proposed Facilities.

A. Provide trees and landscaping.

B. South area:

(1) Enlarge the ramp and parking lot.

(2) Provide additional parking, picnic sites and group shelters in the area near the beach.

(3) Install a new ramp with parking, dock, sanitary facilities, picnic tables, group shelter and play field in the area east of the office.

(4) Add additional dolphins to serve as a buffer between shoreline activities and barge traffic.

(5) Fence the east and west boundaries.

C. North area:

(1) Renovate the campground and add a washhouse for campers only.

(2) Erect observation platforms at each end of the site and connect them with a loop trail system.

(3) Provide fishing piers upstream and downstream of the spillway and connect with the loop trail.

10-10 CLEWISTON RECREATION AREA

Plate 11

10-10.1 General Description.

The Clewiston Recreation Area consists of about 2,000 feet of a linear shoreline berm adjacent to the Lake Okeechobee levee and west of Hurricane Gate No. 2. Historically, the site has been a city-maintained park used for picnicking, shoreline fishing, and viewing the lake. Access to the shoreline park is gained through a public ramp area maintained by the city of Clewiston on the inland side of the levee berm and across a canal.

The site affords access to the Lake Okeechobee shoreline for city residents and visitors. Although Clewiston is located on the lake, views are obscured by the levee system, and this is the only area available for viewing the lake.

10-10.2 Site Analysis.

The berm is very narrow with about 30-40 feet of level ground between the paved access road and shoreline. During the installation of shoreline revetment, the existing tree cover and damaged picnic tables were removed. Upon installing revetment, it was recognized that the impact on shoreline fishing would be significant. Consequently, concrete fishing piers were placed 150 feet apart on the park's shoreline. These piers offer a focus for rehabilitating the area with new picnicking facilities and landscaping.

10-10.3 Design Objectives.

A. Restore picnicking use and enhance sightseeing activities.

10-10.4 Proposed Facilities.

A. Install 19 individual covered picnic shelters.

B. Install low-maintenance landscaping for shade and interest.

C. Provide support facilities such as parking, security lighting, entrance gate, sanitary facilities, and on-site water supply. Due to site limitations on the levee and berm, restrooms will be located adjacent to the city boat ramp to be used as shared facilities.

D. Selectively clear vegetation on tree islands to enhance views of the lake and marsh.

10-11 TYPICAL SITE DEVELOPMENT PLANS

Figures 10 A, 10 B, and 10 C.

10-11.1 General Description.

The remaining recreation sites that are part of the project are 40 acres or less in size. These sites are typically road ends that are used regularly for boat launching, areas with a narrow berm between the levee and the shoreline, or access areas to hurricane gates or similar structures. The sites do not have the minimum required facilities. Most of the sites may be affected by the shoreline revetment plans.

10-11.2 Design Objectives.

A. Provide minimum sanitary and safety facilities in existing public-use areas.

B. Provide sufficient parking for boat launching and improve the ramps and add docks. Typical sites in this category are South (Figure 10 A) Hicpochee Access and North, La Belle Access, Alva Access, Buckhead Ridge, Indian Prairie, Big Bare Beach, Harney Pond, Lakeport, Fisheating Creek, and Sportsman Village.

C. Provide a means for a continuous trail around the Lake. This will require permitting limited access across the lock structures and installing pedestrian bridges across the canals associated with hurricane gate structures. Pedestrian bridges should be downstream of the structures to permit fishing in the turbulent waters while discouraging fishermen from climbing onto the structures or around security fences.

D. Provide safe access over portions of the revetment to the shoreline. Areas should be provided for people to beach boats without damage from the revetment to boat hulls. Typical sites in this category are Nubbin Slough (Figure 10 B), Canal Point, Taylor Creek, Henry Creek, and Chancey Bay.

E. Protect boat launching ramps from wind and wave action along the eastern shore of the Lake. Typical sites in this category are Canal Point, Taylor Creek, Nubbin Slough, Henry Creek and Chancey Bay.

F. Restrict boat launching in areas where sufficient parking and/or proper access over the levee to the shore is not available. Typical sites for this category are Bacom Point (Figure 10 C), Rardin Park, and John Stretch Park.

G. Provide fishing piers in areas of heavy use, such as downstream of hurricane gate structures and spillways.

H. Provide observation platforms wherever possible around the Lake. Typical sites providing good views of the resource are Bacom Point, Rardin Park, Clewiston Lock, and Fisheating Creek.

I. Provide shade trees and landscaping.

10-12 SITE ANALYSES AND CONCEPTUAL DEVELOPMENT PLANS

10-12.1 Index and Location Map for Conceptual Development Plans. See Plate X of 10.

10-12.2 Site Analyses. See Plates 1A - 11A.

10-12.3 Conceptual Development Plans. See Plates 1 - 11.

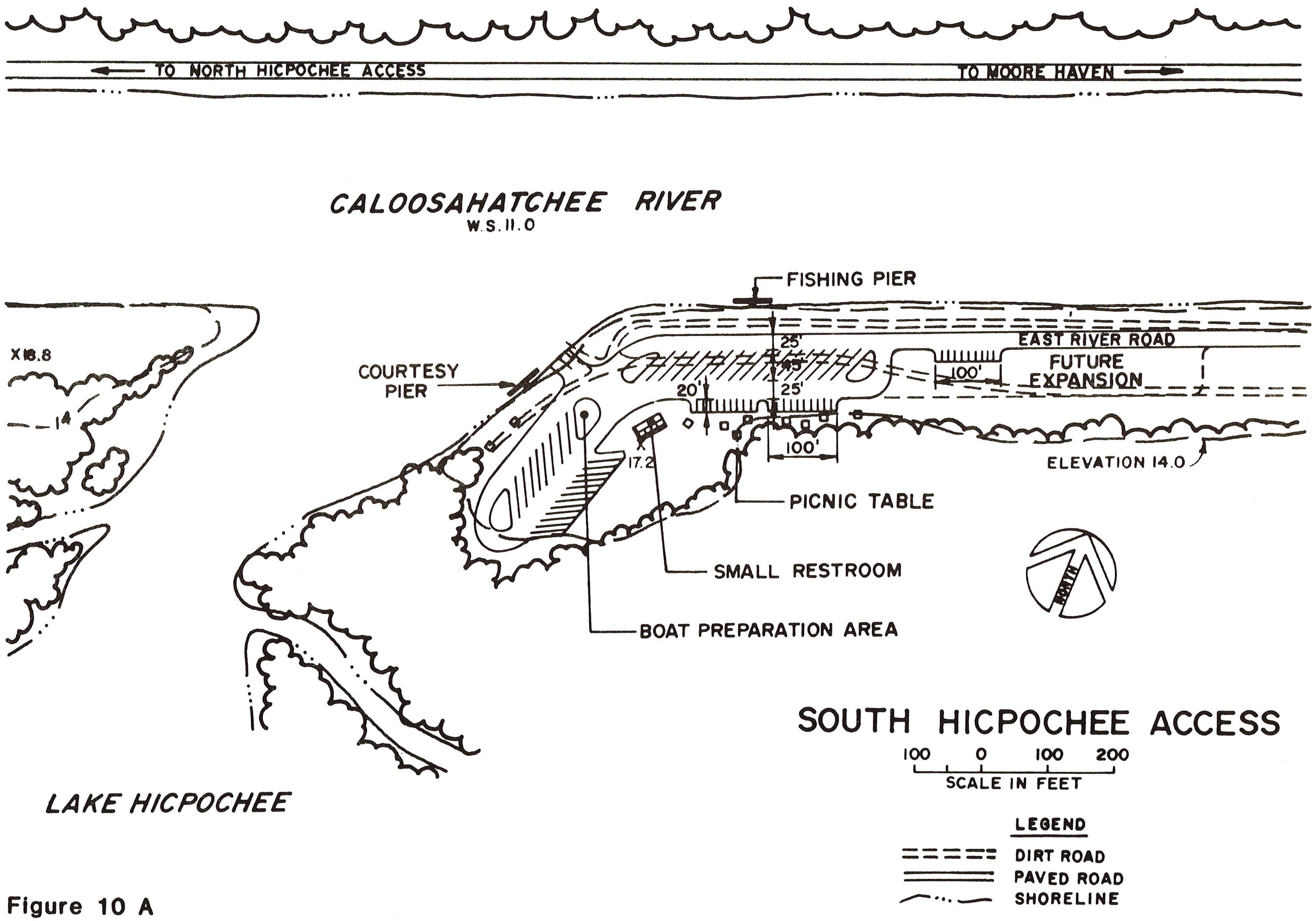

TO NORTH HICPOCHEE ACCESS
TO MOORE HAVEN
CALOOSAHATCHEE RIVER
W.S. 11.0
FISHING PIER
X16.8
14
COURTESY PIER
25'
45'
25'
20'
EAST RIVER ROAD
100'
FUTURE EXPANSION
100'
ELEVATION 14.0
17.2
PICNIC TABLE
SMALL RESTROOM
BOAT PREPARATION AREA
NORTH
LAKE HICPOCHEE
SOUTH HICPOCHEE ACCESS
100 0 100 200
SCALE IN FEET
LEGEND
DIRT ROAD
PAVED ROAD
SHORELINE

Figure 10 A

NOTE: See page 10-7 for Figures 10 B and 10 C.

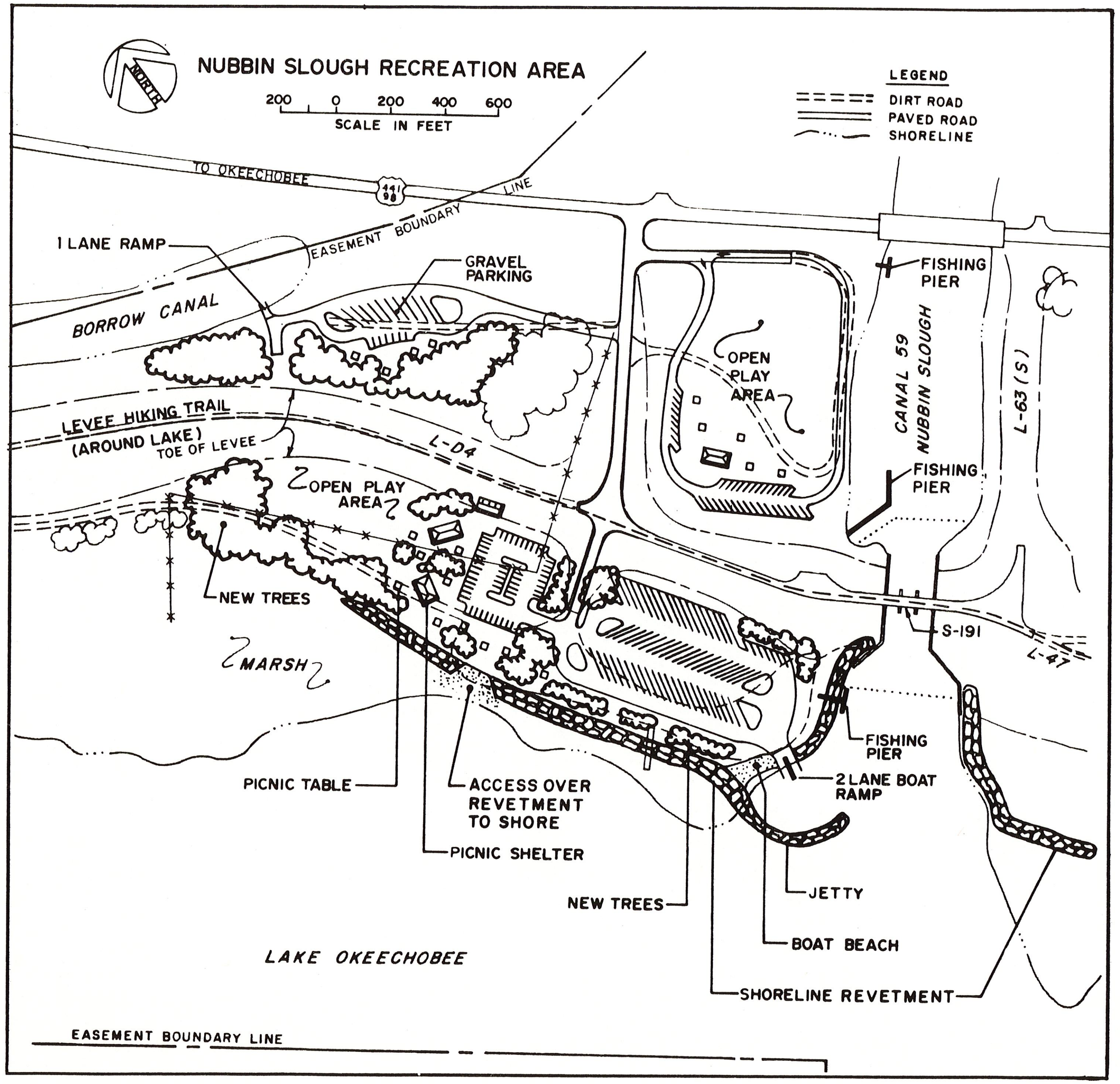

NUBBIN SLOUGH RECREATION AREA
NORTH
200 0 200 400 600
SCALE IN FEET
LEGEND
DIRT ROAD
PAVED ROAD
SHORELINE
TO OKEECHOBEE
441 98
EASEMENT BOUNDARY LINE
1 LANE RAMP
BORROW CANAL
GRAVEL PARKING
FISHING PIER
OPEN PLAY AREA
CANAL 59 NUBBIN SLOUGH
L-63 (S)
LEVEE HIKING TRAIL (AROUND LAKE)
TOE OF LEVEE
L-D4
FISHING PIER
OPEN PLAY AREA
NEW TREES
S-191
L-47
MARSH
FISHING PIER
PICNIC TABLE
ACCESS OVER REVETMENT TO SHORE
2 LANE BOAT RAMP
PICNIC SHELTER
JETTY
NEW TREES
BOAT BEACH
LAKE OKEECHOBEE
SHORELINE REVETMENT
EASEMENT BOUNDARY LINE

Figure 10 B

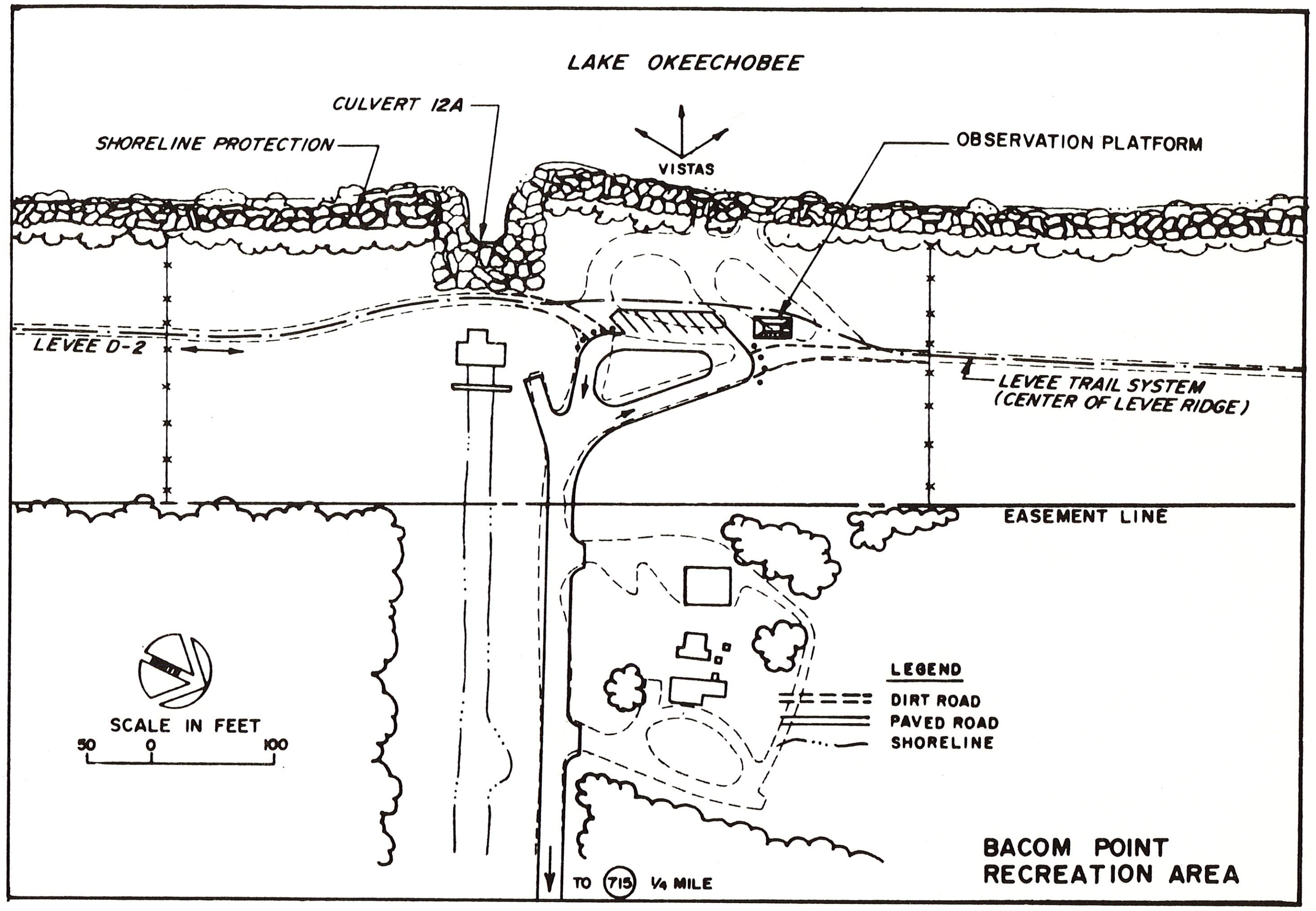
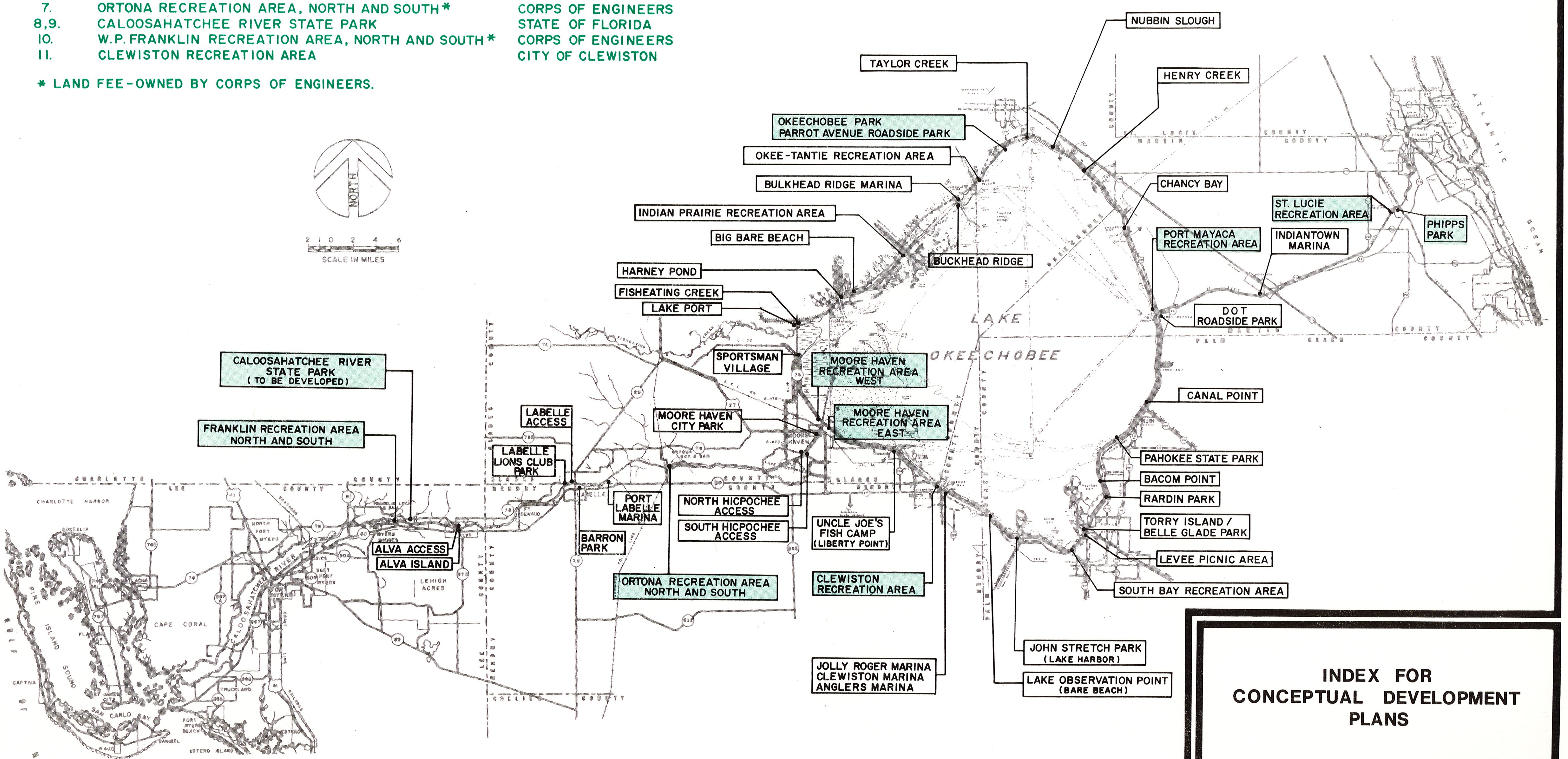

LAKE OKEECHOBEE
CULVERT 12A
SHORELINE PROTECTION
VISTAS
OBSERVATION PLATFORM
LEVEE D-2
LEVEE TRAIL SYSTEM (CENTER OF LEVEE RIDGE)
EASEMENT LINE
SCALE IN FEET
50 0 100
LEGEND
DIRT ROAD
PAVED ROAD
SHORELINE
TO 715 1/4 MILE
BACOM POINT RECREATION AREA

Figure 10 C

INDEX

PLATE	AREA	SPONSOR
1.	ST. LUCIE RECREATION AREA *	CORPS OF ENGINEERS
2.	PHIPPS PARK	MARTIN COUNTY
3.	PORT MAYACA RECREATION AREA	SOUTH FLORIDA WATER MANAGEMENT DISTRICT
4.	OKEECHOBEE PARK	OKEECHOBEE COUNTY
5.	MOORE HAVEN RECREATION AREA, WEST*	CORPS OF ENGINEERS/CONCESSION SITE
6.	MOORE HAVEN RECREATION AREA, EAST*	CORPS OF ENGINEERS
7.	ORTONA RECREATION AREA, NORTH AND SOUTH*	CORPS OF ENGINEERS
8,9.	CALOOSAHATCHEE RIVER STATE PARK	STATE OF FLORIDA
10.	W.P. FRANKLIN RECREATION AREA, NORTH AND SOUTH*	CORPS OF ENGINEERS
11.	CLEWISTON RECREATION AREA	CITY OF CLEWISTON

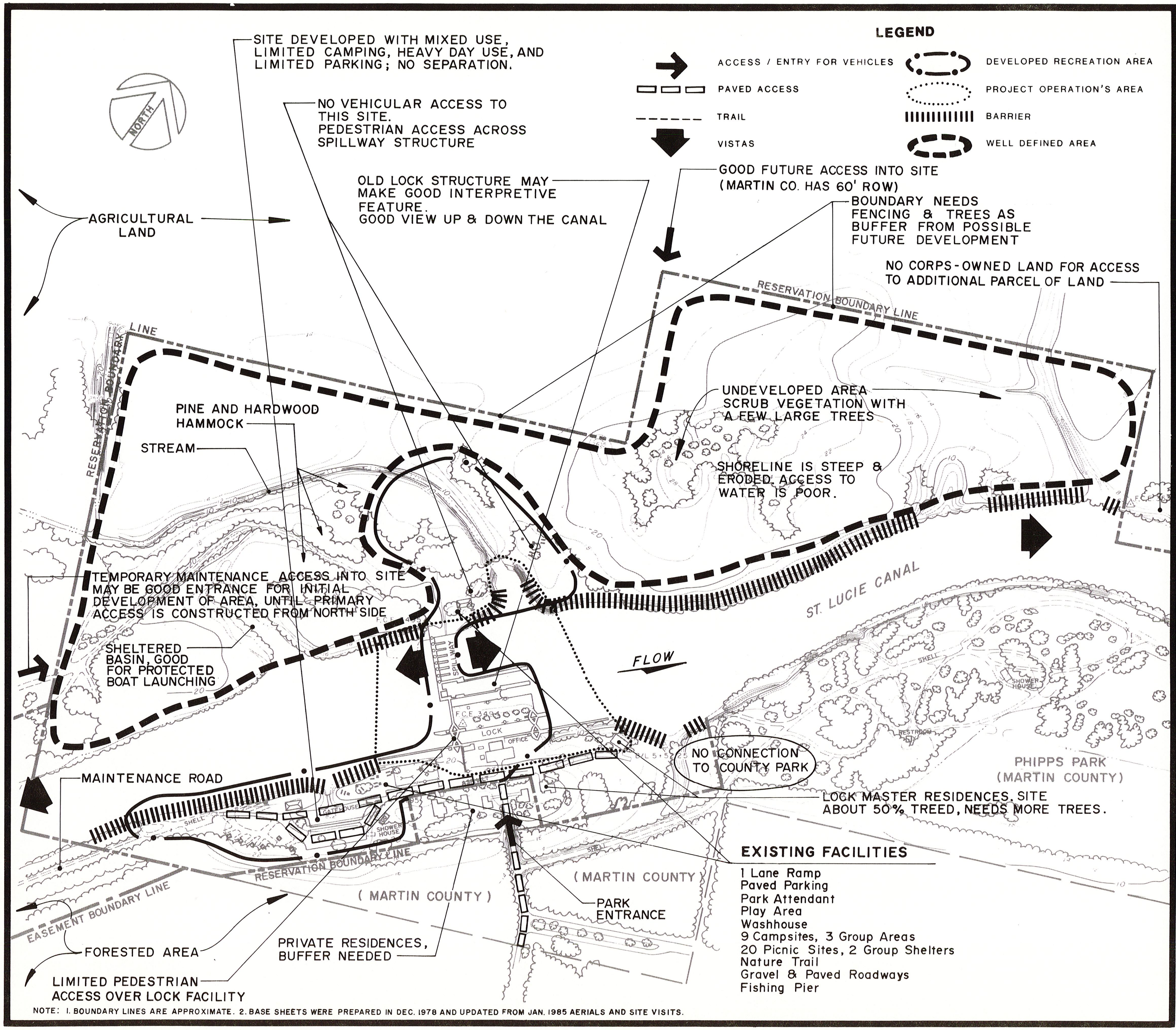
* LAND FEE-OWNED BY CORPS OF ENGINEERS.


NORTH
2 1 0 2 4 6
SCALE IN MILES
NUBBIN SLOUGH
TAYLOR CREEK
HENRY CREEK
OKEECHOBEE PARK
PARROT AVENUE ROADSIDE PARK
OKEE-TANTIE RECREATION AREA
BULKHEAD RIDGE MARINA
CHANCY BAY
INDIAN PRAIRIE RECREATION AREA
ST. LUCIE RECREATION AREA
PHIPPS PARK
BIG BARE BEACH
PORT MAYACA RECREATION AREA
INDIANTOWN MARINA
BUCKHEAD RIDGE
HARNEY POND
FISHEATING CREEK
LAKE PORT
DOT ROADSIDE PARK
LAKE
OKEECHOBEE
SPORTSMAN VILLAGE
MOORE HAVEN RECREATION AREA WEST
CALOOSAHATCHEE RIVER STATE PARK (TO BE DEVELOPED)
CANAL POINT
LABELLE ACCESS
MOORE HAVEN CITY PARK
MOORE HAVEN RECREATION AREA EAST
FRANKLIN RECREATION AREA NORTH AND SOUTH
LABELLE LIONS CLUB PARK
PAHOKEE STATE PARK
BACOM POINT
NORTH HICPOCHEE ACCESS
RARDIN PARK
PORT LABELLE MARINA
SOUTH HICPOCHEE ACCESS
UNCLE JOE'S FISH CAMP (LIBERTY POINT)
TORRY ISLAND / BELLE GLADE PARK
ALVA ACCESS
ALVA ISLAND
BARRON PARK
LEVEE PICNIC AREA
ORTONA RECREATION AREA NORTH AND SOUTH
CLEWISTON RECREATION AREA
SOUTH BAY RECREATION AREA
JOHN STRETCH PARK (LAKE HARBOR)
JOLLY ROGER MARINA
CLEWISTON MARINA
ANGLERS MARINA
LAKE OBSERVATION POINT (BARE BEACH)
CHARLOTTE
LEE
COUNTY
HENDRY
GLADES
COLLIER
MARTIN
ST. LUCIE
PALM BEACH
OKEECHOBEE
ATLANTIC
OCEAN
GULF OF MEXICO
CAPE CORAL
LEHIGH ACRES
PINE ISLAND
SAN CARLOS BAY
CHARLOTTE HARBOR
CAPTIVA
SANIBEL
ESTERO ISLAND
FORT MYERS
NORTH FORT MYERS
EAST FORT MYERS
CALOOSAHATCHEE
RIVER

INDEX FOR CONCEPTUAL DEVELOPMENT PLANS

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

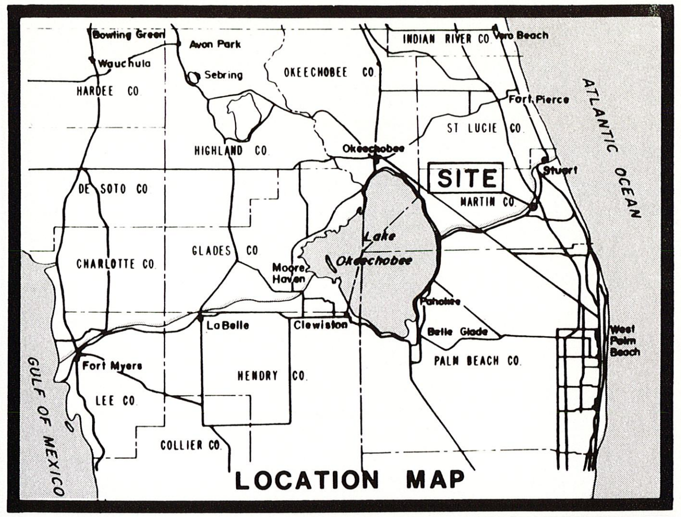
US Army Corps of Engineers


NORTH
LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA
SITE DEVELOPED WITH MIXED USE, LIMITED CAMPING, HEAVY DAY USE, AND LIMITED PARKING; NO SEPARATION.
NO VEHICULAR ACCESS TO THIS SITE. PEDESTRIAN ACCESS ACROSS SPILLWAY STRUCTURE
OLD LOCK STRUCTURE MAY MAKE GOOD INTERPRETIVE FEATURE. GOOD VIEW UP & DOWN THE CANAL
GOOD FUTURE ACCESS INTO SITE (MARTIN CO. HAS 60' ROW)
BOUNDARY NEEDS FENCING & TREES AS BUFFER FROM POSSIBLE FUTURE DEVELOPMENT
NO CORPS-OWNED LAND FOR ACCESS TO ADDITIONAL PARCEL OF LAND
AGRICULTURAL LAND
RESERVATION BOUNDARY LINE
PINE AND HARDWOOD HAMMOCK
STREAM
UNDEVELOPED AREA SCRUB VEGETATION WITH A FEW LARGE TREES
SHORELINE IS STEEP & ERODED. ACCESS TO WATER IS POOR.
TEMPORARY MAINTENANCE ACCESS INTO SITE MAY BE GOOD ENTRANCE FOR INITIAL DEVELOPMENT OF AREA, UNTIL PRIMARY ACCESS IS CONSTRUCTED FROM NORTH SIDE
SHELTERED BASIN, GOOD FOR PROTECTED BOAT LAUNCHING
ST. LUCIE CANAL
FLOW
SPILLWAY
F.C.E. 349
LOCK
OFFICE
SHELL
SHOWER HOUSE
RESTROOM
NO CONNECTION TO COUNTY PARK
PHIPPS PARK (MARTIN COUNTY)
MAINTENANCE ROAD
LOCK MASTER RESIDENCES. SITE ABOUT 50% TREED, NEEDS MORE TREES.
GATEHOUSE
RESERVATION BOUNDARY LINE
EASEMENT BOUNDARY LINE
(MARTIN COUNTY)
(MARTIN COUNTY)
PARK ENTRANCE
FORESTED AREA
PRIVATE RESIDENCES, BUFFER NEEDED
LIMITED PEDESTRIAN ACCESS OVER LOCK FACILITY

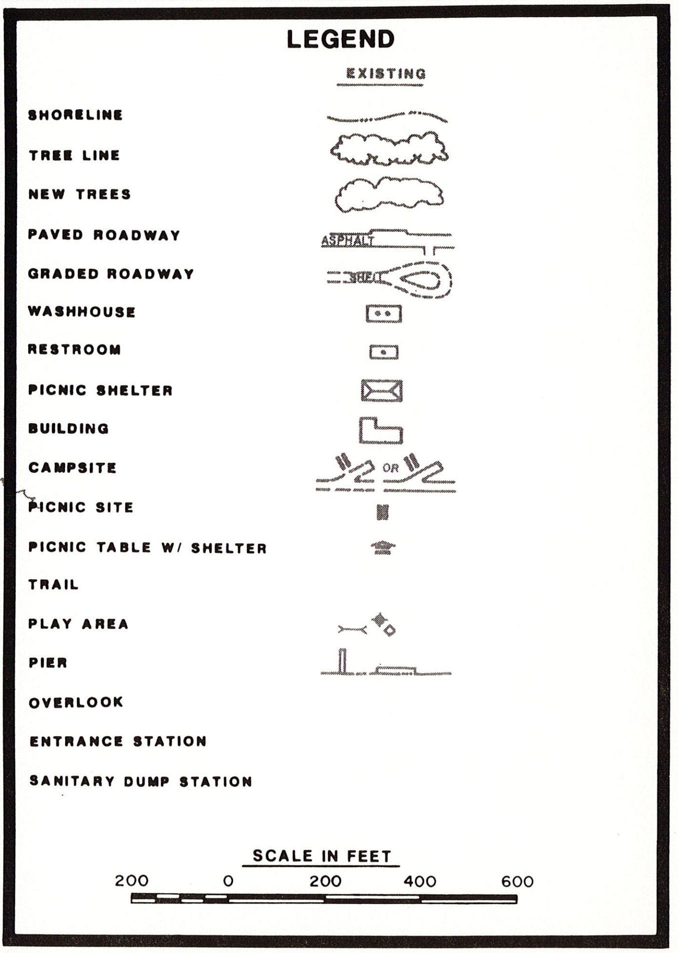
EXISTING FACILITIES

1 Lane Ramp
Paved Parking
Park Attendant
Play Area
Washhouse
9 Campsites, 3 Group Areas
20 Picnic Sites, 2 Group Shelters
Nature Trail
Gravel & Paved Roadways
Fishing Pier

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Wauchula
Avon Park
Sebring
HARDEE CO
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
ST LUCIE CO
ATLANTIC OCEAN
HIGHLAND CO
Okeechobee
SITE
MARTIN CO
Stuart
DE SOTO CO
Lake Okeechobee
CHARLOTTE CO
GLADES CO
Moore Haven
Pahokee
Clewiston
LaBelle
Belle Glade
PALM BEACH CO
West Palm Beach
GULF OF MEXICO
Fort Myers
LEE CO
HENDRY CO
COLLIER CO

LOCATION MAP

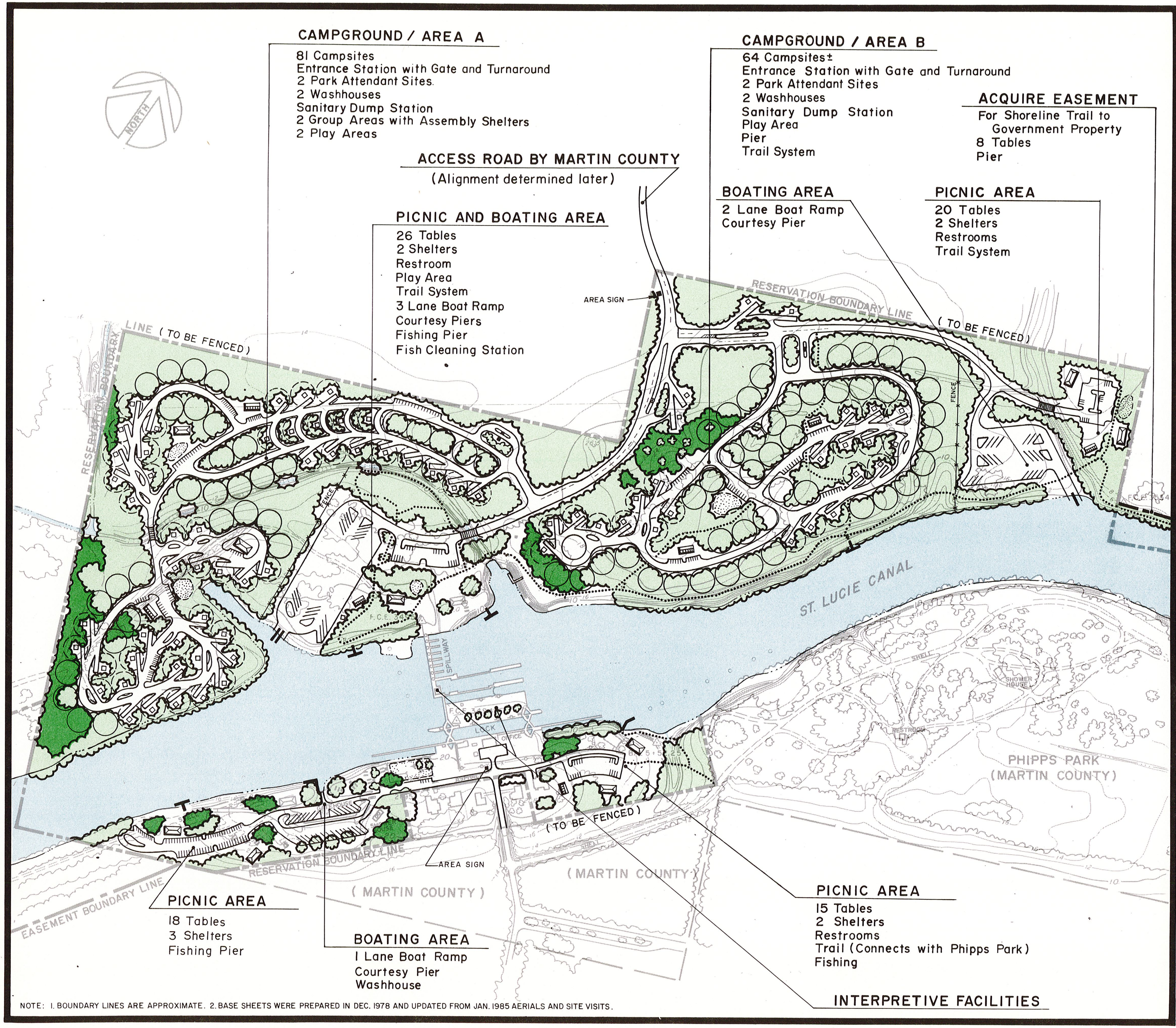

LEGEND
EXISTING
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
SHELL
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Site Analysis

ST. LUCIE RECREATION AREA

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers


NORTH
RESERVATION BOUNDARY LINE (TO BE FENCED)
AREA SIGN
FENCE
ST. LUCIE CANAL
SPILLWAY
LOCK
SHOWER HOUSE
RESTROOM
PHIPPS PARK
(MARTIN COUNTY)
(MARTIN COUNTY)
(TO BE FENCED)
EASEMENT BOUNDARY LINE
AREA SIGN

CAMPGROUND / AREA A

81 Campsites
Entrance Station with Gate and Turnaround
2 Park Attendant Sites.
2 Washhouses
Sanitary Dump Station
2 Group Areas with Assembly Shelters
2 Play Areas

ACCESS ROAD BY MARTIN COUNTY

(Alignment determined later)

PICNIC AND BOATING AREA

26 Tables
2 Shelters
Restroom
Play Area
Trail System
3 Lane Boat Ramp
Courtesy Piers
Fishing Pier
Fish Cleaning Station

CAMPGROUND / AREA B

64 Campsites±
Entrance Station with Gate and Turnaround
2 Park Attendant Sites
2 Washhouses
Sanitary Dump Station
Play Area
Pier
Trail System

ACQUIRE EASEMENT

For Shoreline Trail to
Government Property
8 Tables
Pier

BOATING AREA

2 Lane Boat Ramp
Courtesy Pier

PICNIC AREA

20 Tables
2 Shelters
Restrooms
Trail System

PICNIC AREA

18 Tables
3 Shelters
Fishing Pier

BOATING AREA

1 Lane Boat Ramp
Courtesy Pier
Washhouse

PICNIC AREA

15 Tables
2 Shelters
Restrooms
Trail (Connects with Phipps Park)
Fishing

INTERPRETIVE FACILITIES

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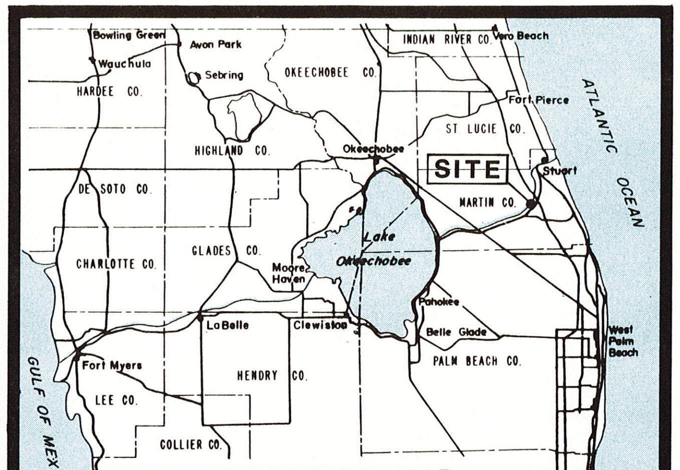

Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
ATLANTIC OCEAN
HIGHLAND CO.
Okeechobee
SITE
Stuart
MARTIN CO.
DE SOTO CO.
Lake Okeechobee
CHARLOTTE CO.
GLADES CO.
Moore Haven
Pahokee
Belle Glade
LaBelle
Clewiston
West Palm Beach
PALM BEACH CO.
Fort Myers
HENDRY CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

	EXISTING	PROPOSED
SHORELINE		
TREE LINE		
NEW TREES		
PAVED ROADWAY	ASPHALT	
GRADED ROADWAY	SHELL	
WASHHOUSE		
RESTROOM		
PICNIC SHELTER		
BUILDING		
CAMPSITE	OR	AS NOTED
PICNIC SITE		
PICNIC TABLE W/ SHELTER		
TRAIL		
PLAY AREA		
PIER		
OVERLOOK		
ENTRANCE STATION		
SANITARY DUMP STATION		

SCALE IN FEET
200 0 200 400 600

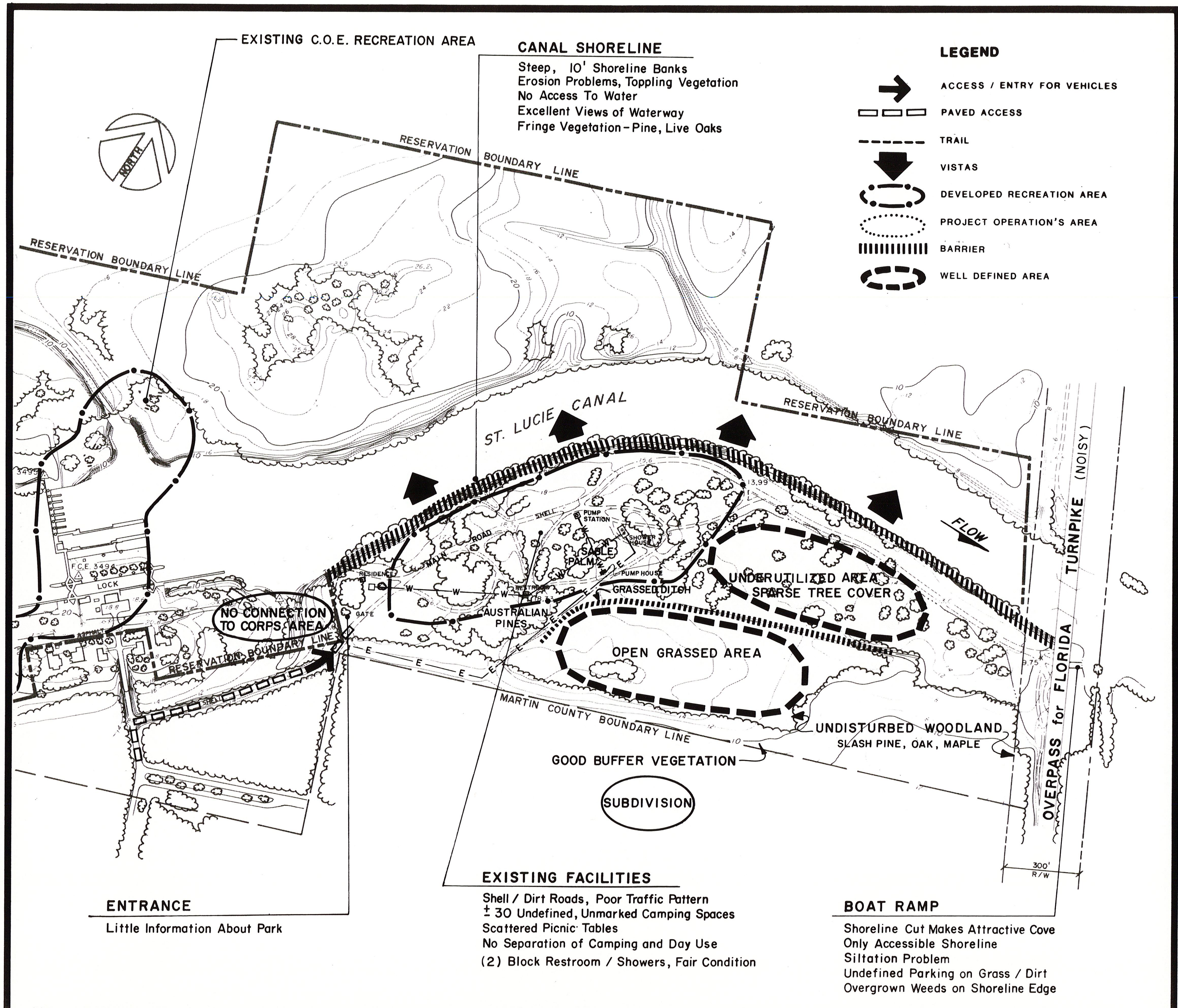
Conceptual Development Plan

ST. LUCIE RECREATION AREA

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers
Jacksonville District

PLATE 1 OF 10


NORTH
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
ST. LUCIE CANAL
FLOW
FLORIDA TURNPIKE (NOISY)
OVERPASS for FLORIDA TURNPIKE
300' R/W
F.C.E 3494
LOCK
NO CONNECTION TO CORPS AREA
GATE
RESIDENCE
SHELL ROAD
PUMP STATION
SHOWER HOUSE
SABLE PALMS
PUMP HOUSE
GRASSED DITCH
AUSTRALIAN PINES
13.99
9.75
UNDERUTILIZED AREA SPARSE TREE COVER
OPEN GRASSED AREA
MARTIN COUNTY BOUNDARY LINE
UNDISTURBED WOODLAND
SLASH PINE, OAK, MAPLE
GOOD BUFFER VEGETATION
SUBDIVISION

EXISTING C.O.E. RECREATION AREA

CANAL SHORELINE

Steep, 10' Shoreline Banks
Erosion Problems, Toppling Vegetation
No Access To Water
Excellent Views of Waterway
Fringe Vegetation – Pine, Live Oaks

LEGEND

- ACCESS / ENTRY FOR VEHICLES
- PAVED ACCESS
- TRAIL
- VISTAS
- DEVELOPED RECREATION AREA
- PROJECT OPERATION'S AREA
- BARRIER
- WELL DEFINED AREA

ENTRANCE

Little Information About Park

EXISTING FACILITIES

Shell / Dirt Roads, Poor Traffic Pattern
± 30 Undefined, Unmarked Camping Spaces
Scattered Picnic Tables
No Separation of Camping and Day Use
(2) Block Restroom / Showers, Fair Condition

BOAT RAMP

Shoreline Cut Makes Attractive Cove
Only Accessible Shoreline
Siltation Problem
Undefined Parking on Grass / Dirt
Overgrown Weeds on Shoreline Edge

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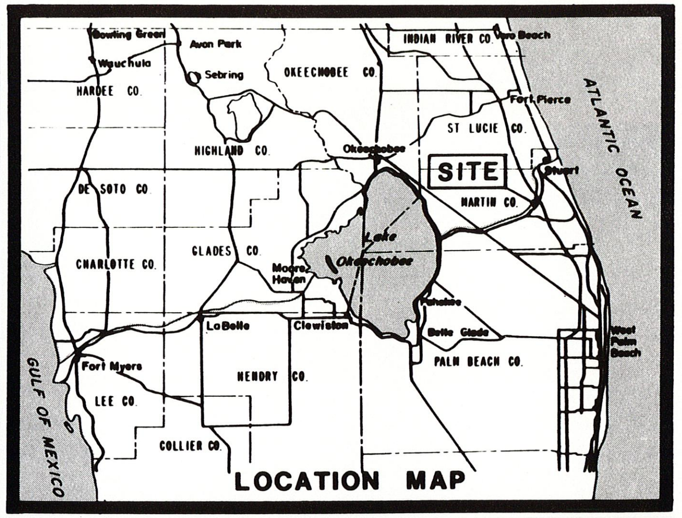

Bowling Green
Wauchula
Avon Park
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
ATLANTIC OCEAN
Okeechobee
SITE
Stuart
MARTIN CO.
HIGHLAND CO.
DE SOTO CO.
CHARLOTTE CO.
GLADES CO.
Moore Haven
Lake Okeechobee
Pahokee
Belle Glade
PALM BEACH CO.
West Palm Beach
LaBelle
Clewiston
HENDRY CO.
Fort Myers
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

EXISTING

- SHORELINE
- TREE LINE
- NEW TREES
- PAVED ROADWAY
- GRADED ROADWAY
- WASHHOUSE
- RESTROOM
- PICNIC SHELTER
- BUILDING
- CAMPSITE
- PICNIC SITE
- PICNIC TABLE W/ SHELTER
- TRAIL
- PLAY AREA
- PIER
- OVERLOOK
- ENTRANCE STATION
- SANITARY DUMP STATION

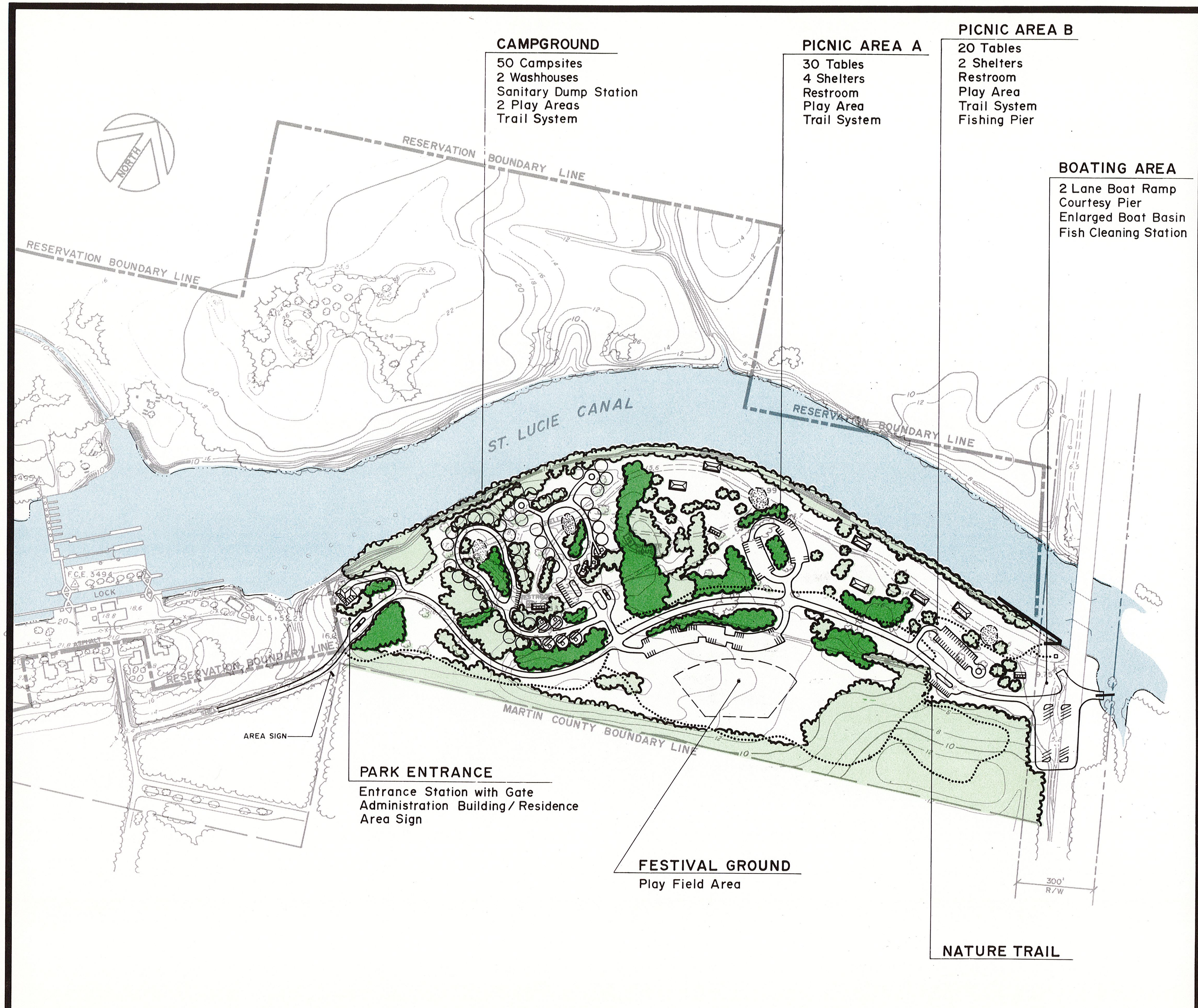
SCALE IN FEET
200 0 200 400 600

Site Analysis

PHIPPS PARK

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers


NORTH
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
RESERVATION BOUNDARY LINE
ST. LUCIE CANAL
F.C.E 3494
LOCK
MARTIN COUNTY BOUNDARY LINE
AREA SIGN
300'
R/W

CAMPGROUND
50 Campsites
2 Washhouses
Sanitary Dump Station
2 Play Areas
Trail System

PICNIC AREA A
30 Tables
4 Shelters
Restroom
Play Area
Trail System

PICNIC AREA B
20 Tables
2 Shelters
Restroom
Play Area
Trail System
Fishing Pier

BOATING AREA
2 Lane Boat Ramp
Courtesy Pier
Enlarged Boat Basin
Fish Cleaning Station

PARK ENTRANCE
Entrance Station with Gate
Administration Building / Residence
Area Sign

FESTIVAL GROUND
Play Field Area

NATURE TRAIL

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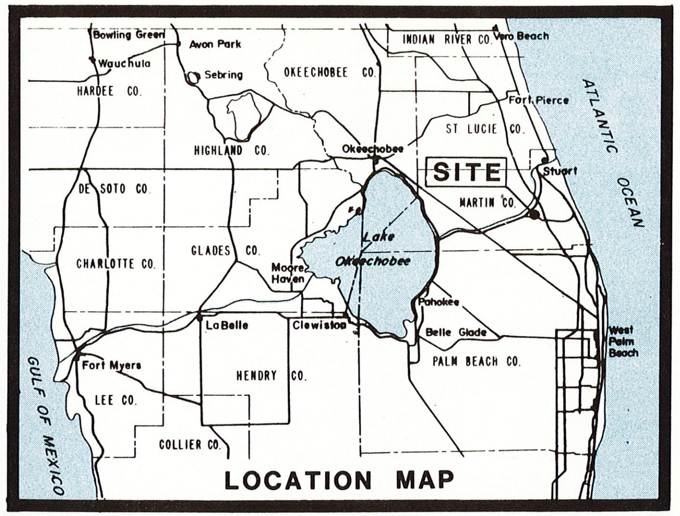
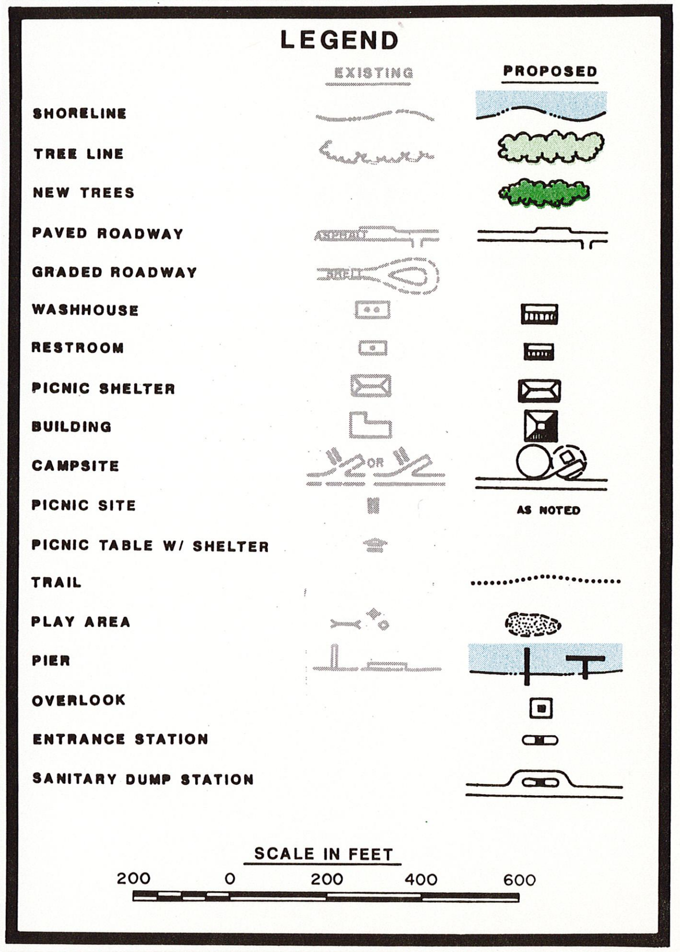

Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
SITE
Stuart
MARTIN CO.
ATLANTIC OCEAN
DE SOTO CO.
CHARLOTTE CO.
GLADES CO.
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
PALM BEACH CO.
West Palm Beach
Fort Myers
LEE CO.
HENDRY CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP


LEGEND
EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
SHELL
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
AS NOTED
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

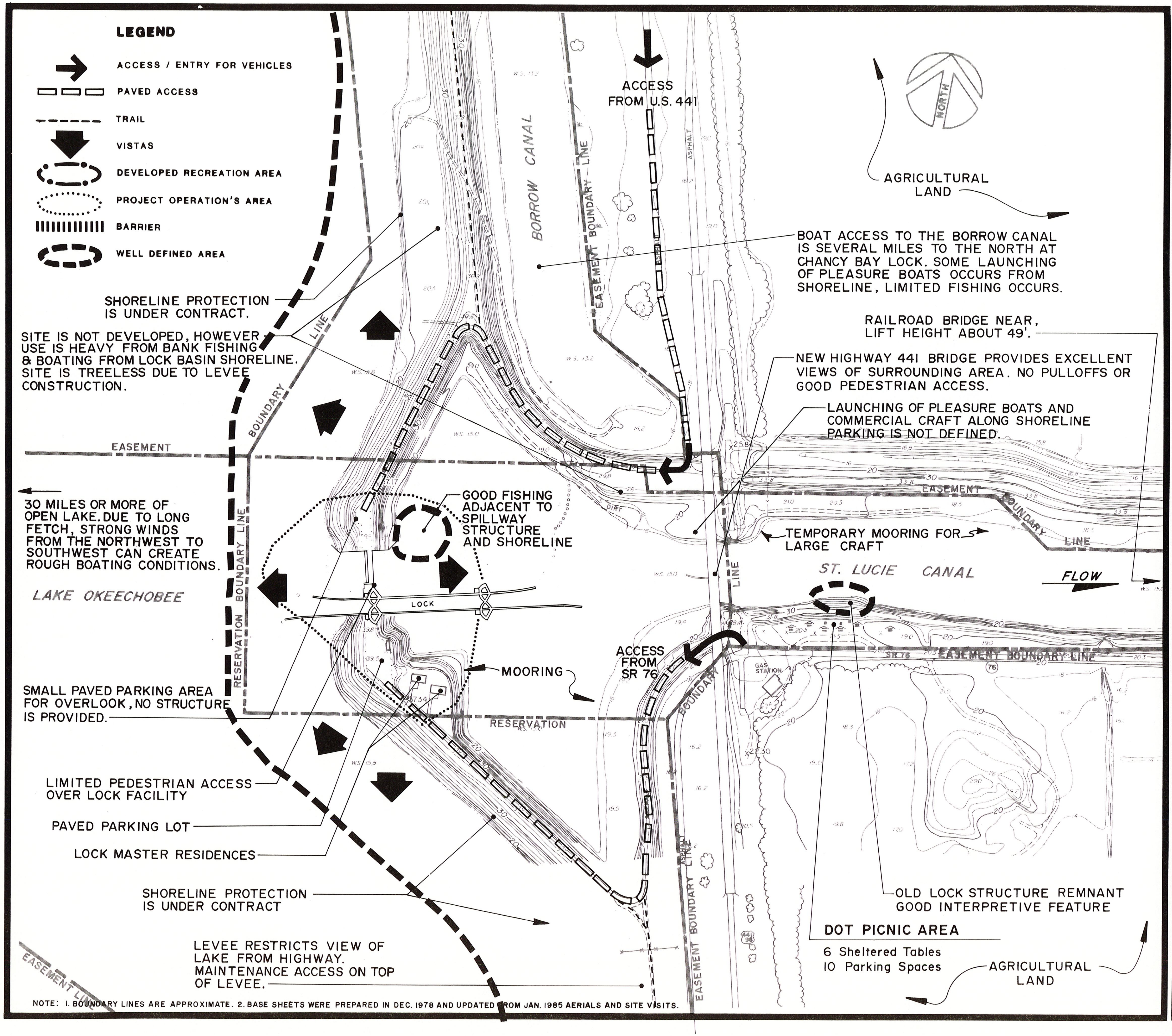
Conceptual Development Plan

PHIPPS PARK

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

PLATE 2 OF 10


LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA
ACCESS FROM U.S. 441
BORROW CANAL
EASEMENT BOUNDARY LINE
ASPHALT
AGRICULTURAL LAND
NORTH
BOUNDARY LINE
EASEMENT
RESERVATION BOUNDARY LINE
LAKE OKEECHOBEE
LOCK
DIRT
EASEMENT
BOUNDARY LINE
ST. LUCIE CANAL
FLOW
MOORING
ACCESS FROM SR 76
GAS STATION
SR 76
EASEMENT BOUNDARY LINE
RESERVATION
BOUNDARY
EASEMENT BOUNDARY LINE
EASEMENT LINE
AGRICULTURAL LAND

SHORELINE PROTECTION IS UNDER CONTRACT.

SITE IS NOT DEVELOPED, HOWEVER USE IS HEAVY FROM BANK FISHING & BOATING FROM LOCK BASIN SHORELINE. SITE IS TREELESS DUE TO LEVEE CONSTRUCTION.

BOAT ACCESS TO THE BORROW CANAL IS SEVERAL MILES TO THE NORTH AT CHANCY BAY LOCK. SOME LAUNCHING OF PLEASURE BOATS OCCURS FROM SHORELINE, LIMITED FISHING OCCURS.

RAILROAD BRIDGE NEAR, LIFT HEIGHT ABOUT 49'.

NEW HIGHWAY 441 BRIDGE PROVIDES EXCELLENT VIEWS OF SURROUNDING AREA. NO PULLOFFS OR GOOD PEDESTRIAN ACCESS.

LAUNCHING OF PLEASURE BOATS AND COMMERCIAL CRAFT ALONG SHORELINE PARKING IS NOT DEFINED.

30 MILES OR MORE OF OPEN LAKE. DUE TO LONG FETCH, STRONG WINDS FROM THE NORTHWEST TO SOUTHWEST CAN CREATE ROUGH BOATING CONDITIONS.

GOOD FISHING ADJACENT TO SPILLWAY STRUCTURE AND SHORELINE

TEMPORARY MOORING FOR LARGE CRAFT

SMALL PAVED PARKING AREA FOR OVERLOOK, NO STRUCTURE IS PROVIDED.

LIMITED PEDESTRIAN ACCESS OVER LOCK FACILITY

PAVED PARKING LOT

LOCK MASTER RESIDENCES

SHORELINE PROTECTION IS UNDER CONTRACT

LEVEE RESTRICTS VIEW OF LAKE FROM HIGHWAY. MAINTENANCE ACCESS ON TOP OF LEVEE.

OLD LOCK STRUCTURE REMNANT GOOD INTERPRETIVE FEATURE

DOT PICNIC AREA

6 Sheltered Tables
10 Parking Spaces

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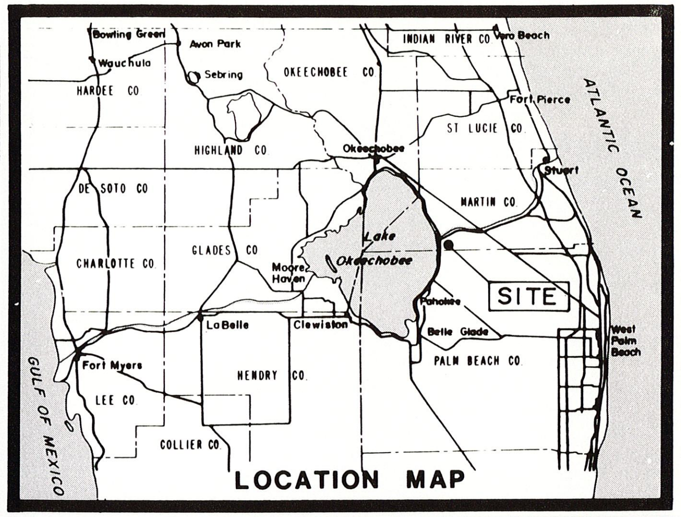
Bowling Green
Avon Park
INDIAN RIVER CO
Vero Beach
Wauchula
Sebring
OKEECHOBEE CO
HARDEE CO
Fort Pierce
ATLANTIC OCEAN
ST LUCIE CO
Okeechobee
HIGHLAND CO
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DE SOTO CO
MARTIN CO
Lake Okeechobee
CHARLOTTE CO
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Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
PALM BEACH CO
GULF OF MEXICO
Fort Myers
HENDRY CO
LEE CO
COLLIER CO

LOCATION MAP

LEGEND

EXISTING

- SHORELINE
- TREE LINE
- NEW TREES
- PAVED ROADWAY
- GRADED ROADWAY
- WASHHOUSE
- RESTROOM
- PICNIC SHELTER
- BUILDING
- CAMPSITE
- PICNIC SITE
- PICNIC TABLE W/ SHELTER
- TRAIL
- PLAY AREA
- PIER
- OVERLOOK
- ENTRANCE STATION
- SANITARY DUMP STATION

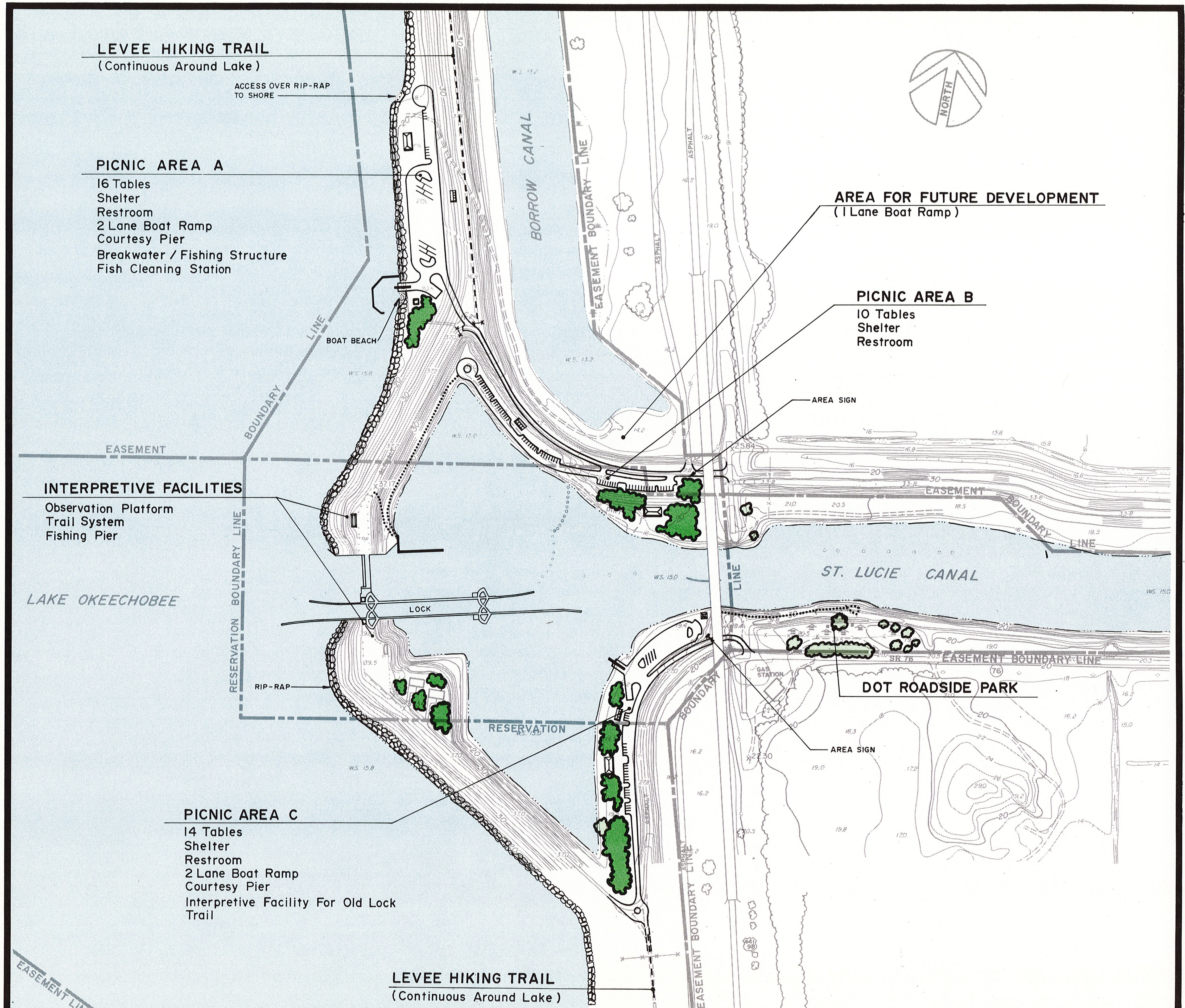
SCALE IN FEET
200 0 200 400 600

Site Analysis

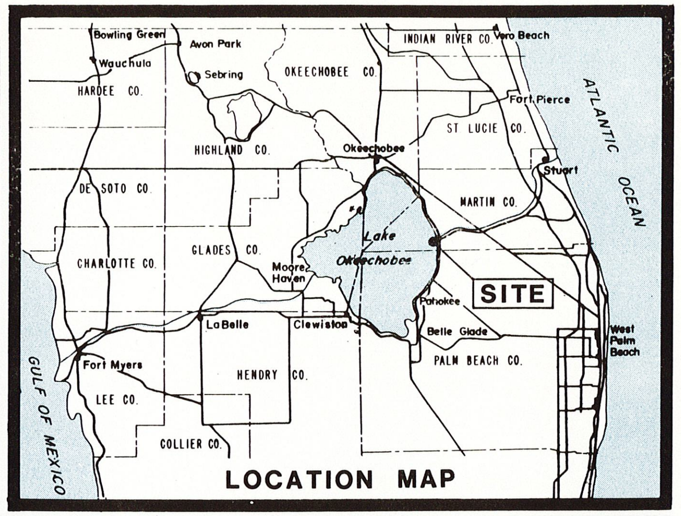
PORT MAYACA RECREATION AREA

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

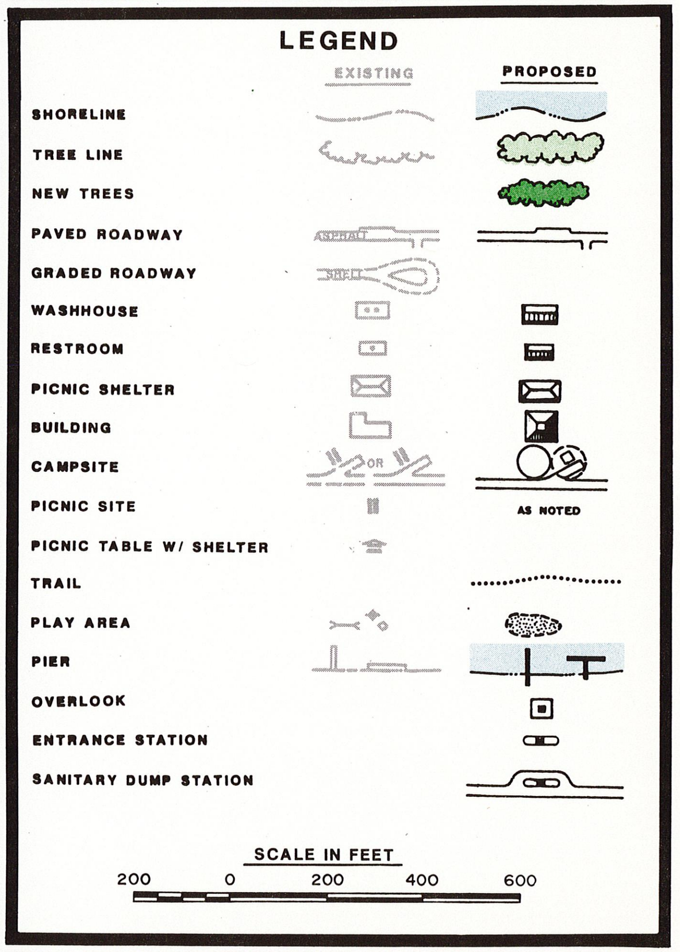
US Army Corps of Engineers


LEVEE HIKING TRAIL
(Continuous Around Lake)
ACCESS OVER RIP-RAP TO SHORE
PICNIC AREA A
16 Tables
Shelter
Restroom
2 Lane Boat Ramp
Courtesy Pier
Breakwater / Fishing Structure
Fish Cleaning Station
BOAT BEACH
BOUNDARY LINE
EASEMENT
INTERPRETIVE FACILITIES
Observation Platform
Trail System
Fishing Pier
LAKE OKEECHOBEE
RESERVATION BOUNDARY LINE
LOCK
RIP-RAP
RESERVATION
PICNIC AREA C
14 Tables
Shelter
Restroom
2 Lane Boat Ramp
Courtesy Pier
Interpretive Facility For Old Lock
Trail
EASEMENT LINE
LEVEE HIKING TRAIL
(Continuous Around Lake)
BORROW CANAL
EASEMENT BOUNDARY LINE
ASPHALT
NORTH
AREA FOR FUTURE DEVELOPMENT
(1 Lane Boat Ramp)
PICNIC AREA B
10 Tables
Shelter
Restroom
AREA SIGN
EASEMENT BOUNDARY LINE
ST. LUCIE CANAL
SR 76
76
EASEMENT BOUNDARY LINE
GAS STATION
DOT ROADSIDE PARK
AREA SIGN
BOUNDARY
EASEMENT BOUNDARY LINE
441
98

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ATLANTIC OCEAN
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
Lake Okeechobee
Moore Haven
SITE
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO.
PALM BEACH CO.
LEE CO.
GULF OF MEXICO
COLLIER CO.

LOCATION MAP


LEGEND
EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
AS NOTED
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

PORT MAYACA
RECREATION AREA

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Use Development and
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of Engineers
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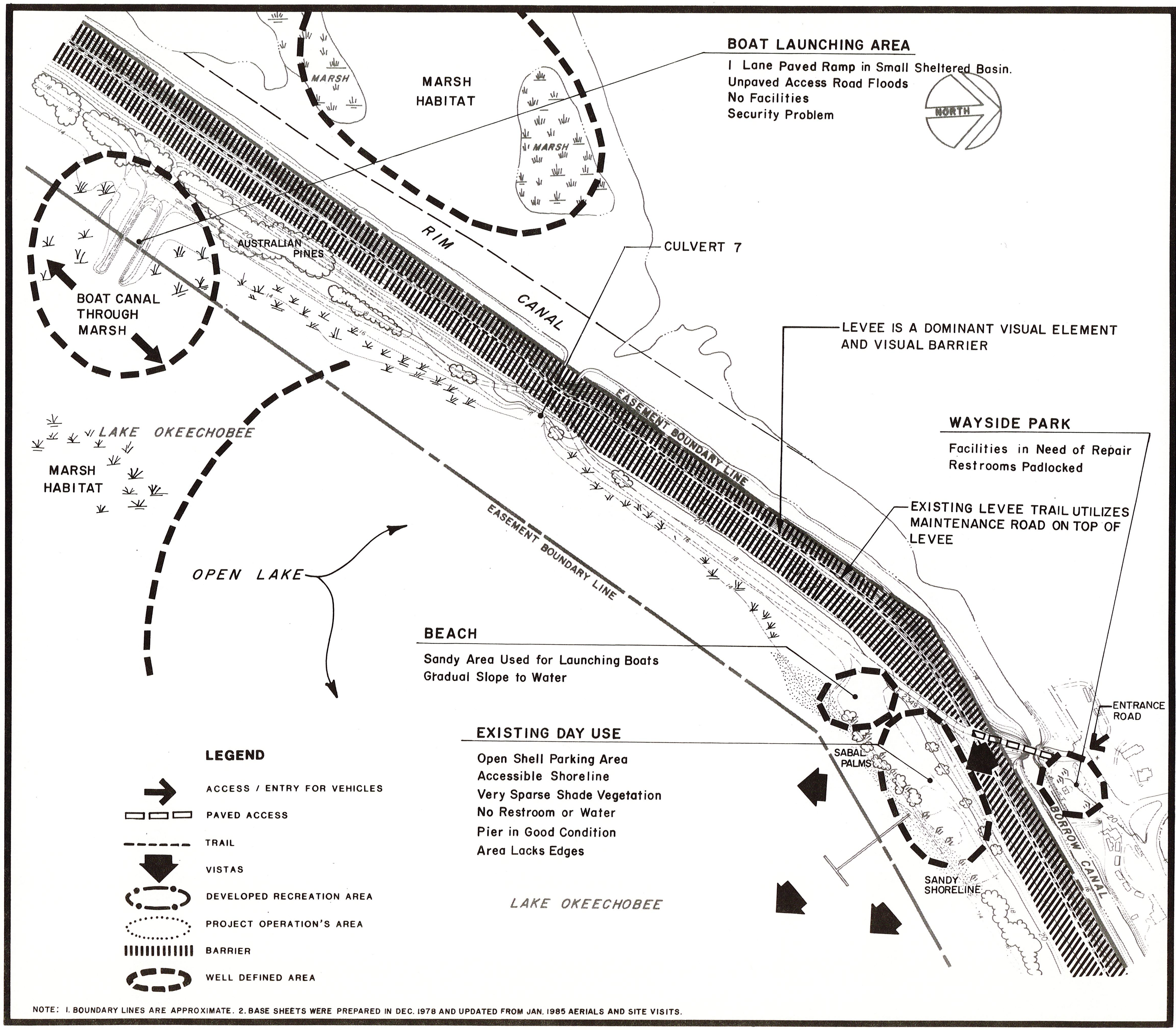

MARSH
MARSH HABITAT
MARSH
NORTH
RIM CANAL
AUSTRALIAN PINES
BOAT CANAL THROUGH MARSH
LAKE OKEECHOBEE
MARSH HABITAT
EASEMENT BOUNDARY LINE
EASEMENT BOUNDARY LINE
OPEN LAKE
ENTRANCE ROAD
SABAL PALMS
SANDY SHORELINE
BORROW CANAL
LAKE OKEECHOBEE

BOAT LAUNCHING AREA

1 Lane Paved Ramp in Small Sheltered Basin.
Unpaved Access Road Floods
No Facilities
Security Problem

CULVERT 7

LEVEE IS A DOMINANT VISUAL ELEMENT AND VISUAL BARRIER

WAYSIDE PARK

Facilities in Need of Repair
Restrooms Padlocked

EXISTING LEVEE TRAIL UTILIZES MAINTENANCE ROAD ON TOP OF LEVEE

BEACH

Sandy Area Used for Launching Boats
Gradual Slope to Water

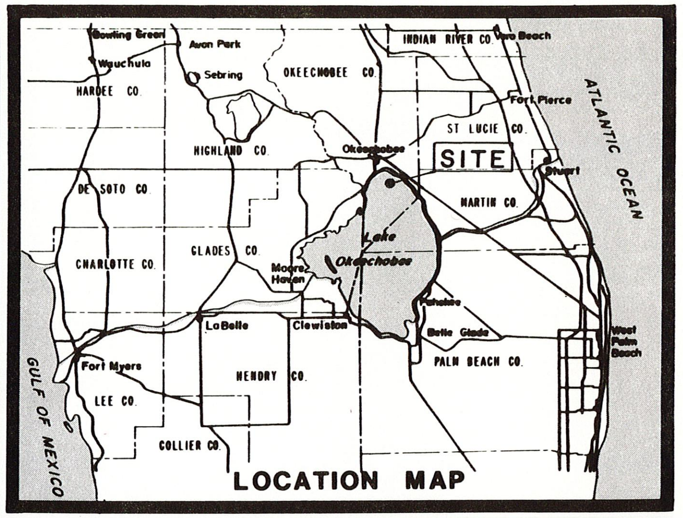
EXISTING DAY USE

Open Shell Parking Area
Accessible Shoreline
Very Sparse Shade Vegetation
No Restroom or Water
Pier in Good Condition
Area Lacks Edges

LEGEND

→	ACCESS / ENTRY FOR VEHICLES
▭▭▭	PAVED ACCESS
------	TRAIL
⬇	VISTAS
	DEVELOPED RECREATION AREA
	PROJECT OPERATION'S AREA
▮▮▮▮▮▮▮▮	BARRIER
	WELL DEFINED AREA

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Wauchula
HARDEE CO
Avon Park
Sebring
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
ST LUCIE CO
SITE
Okeechobee
Stuart
MARTIN CO
ATLANTIC OCEAN
DE SOTO CO
HIGHLAND CO
CHARLOTTE CO
GLADES CO
Moore Haven
Lake Okeechobee
Pahokee
Belle Glade
West Palm Beach
PALM BEACH CO
LaBelle
Clewiston
HENDRY CO
Fort Myers
LEE CO
COLLIER CO
GULF OF MEXICO

LOCATION MAP

LEGEND

EXISTING

SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION

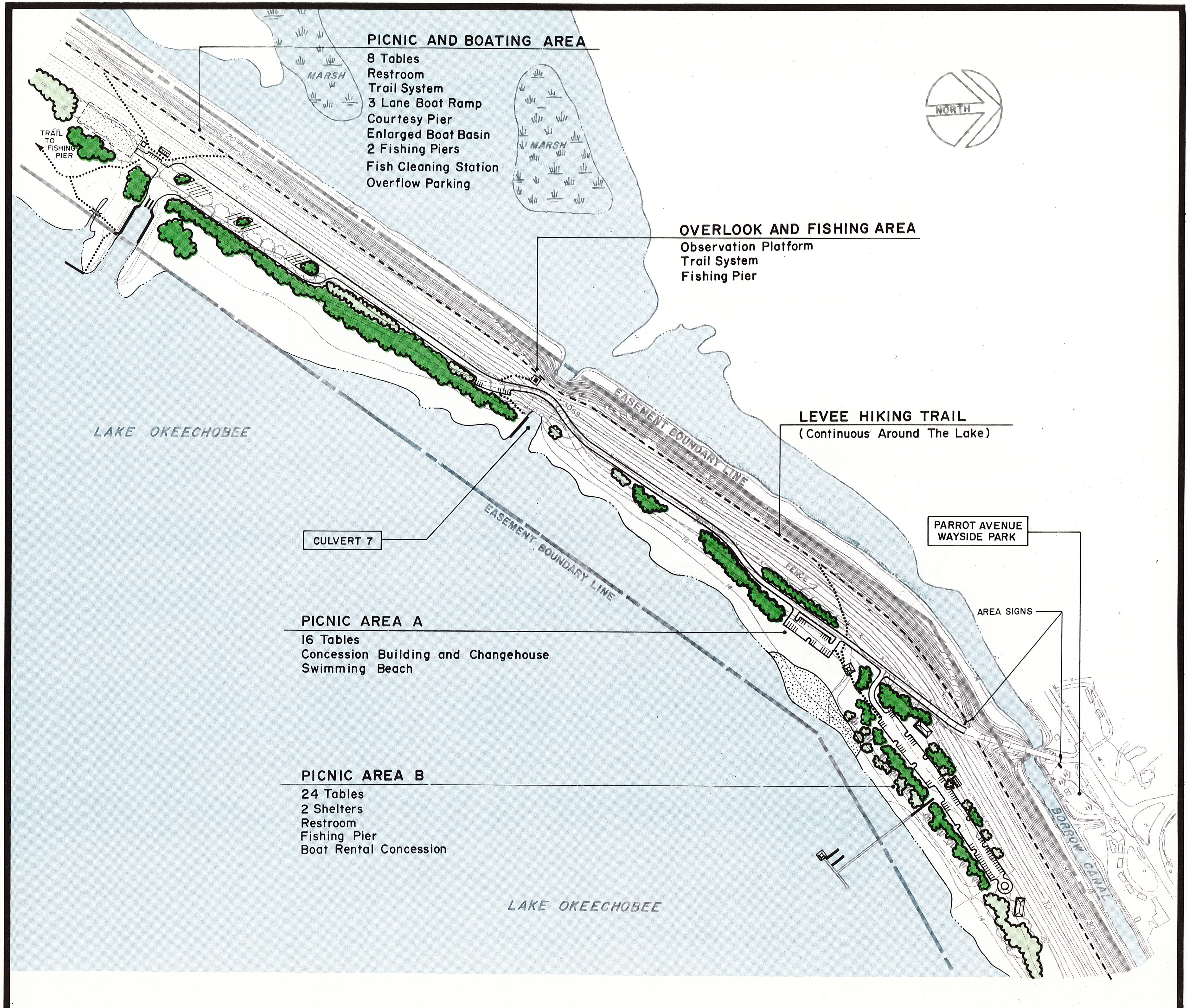
SCALE IN FEET
200 0 200 400 600

Site Analysis

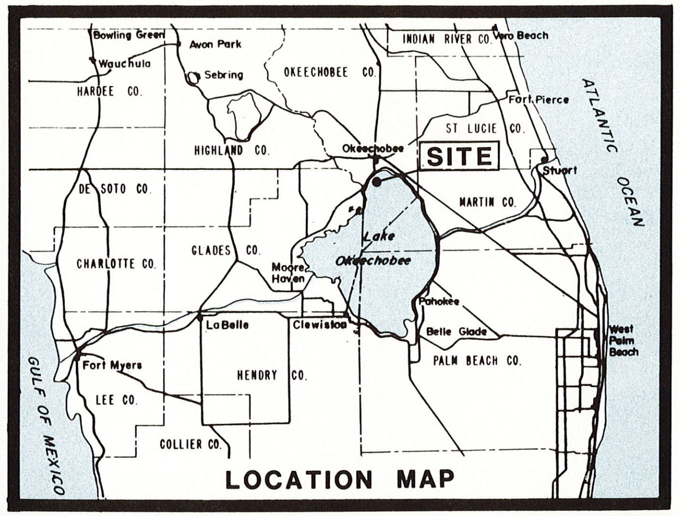
OKEECHOBEE PARK

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers

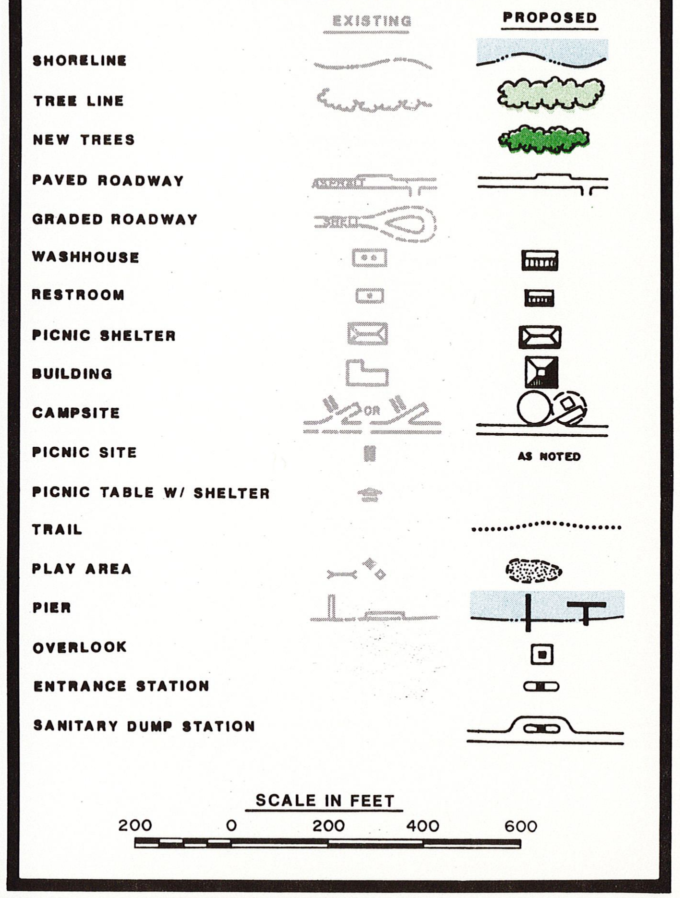

PICNIC AND BOATING AREA
8 Tables
Restroom
Trail System
3 Lane Boat Ramp
Courtesy Pier
Enlarged Boat Basin
2 Fishing Piers
Fish Cleaning Station
Overflow Parking
MARSH
MARSH
NORTH
TRAIL TO FISHING PIER
OVERLOOK AND FISHING AREA
Observation Platform
Trail System
Fishing Pier
LAKE OKEECHOBEE
EASEMENT BOUNDARY LINE
LEVEE HIKING TRAIL
(Continuous Around The Lake)
CULVERT 7
EASEMENT BOUNDARY LINE
PARROT AVENUE WAYSIDE PARK
AREA SIGNS
FENCE
PICNIC AREA A
16 Tables
Concession Building and Changehouse
Swimming Beach
PICNIC AREA B
24 Tables
2 Shelters
Restroom
Fishing Pier
Boat Rental Concession
LAKE OKEECHOBEE
BORROW CANAL

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
SITE
Stuart
DE SOTO CO.
MARTIN CO.
ATLANTIC OCEAN
CHARLOTTE CO.
GLADES CO.
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO.
PALM BEACH CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

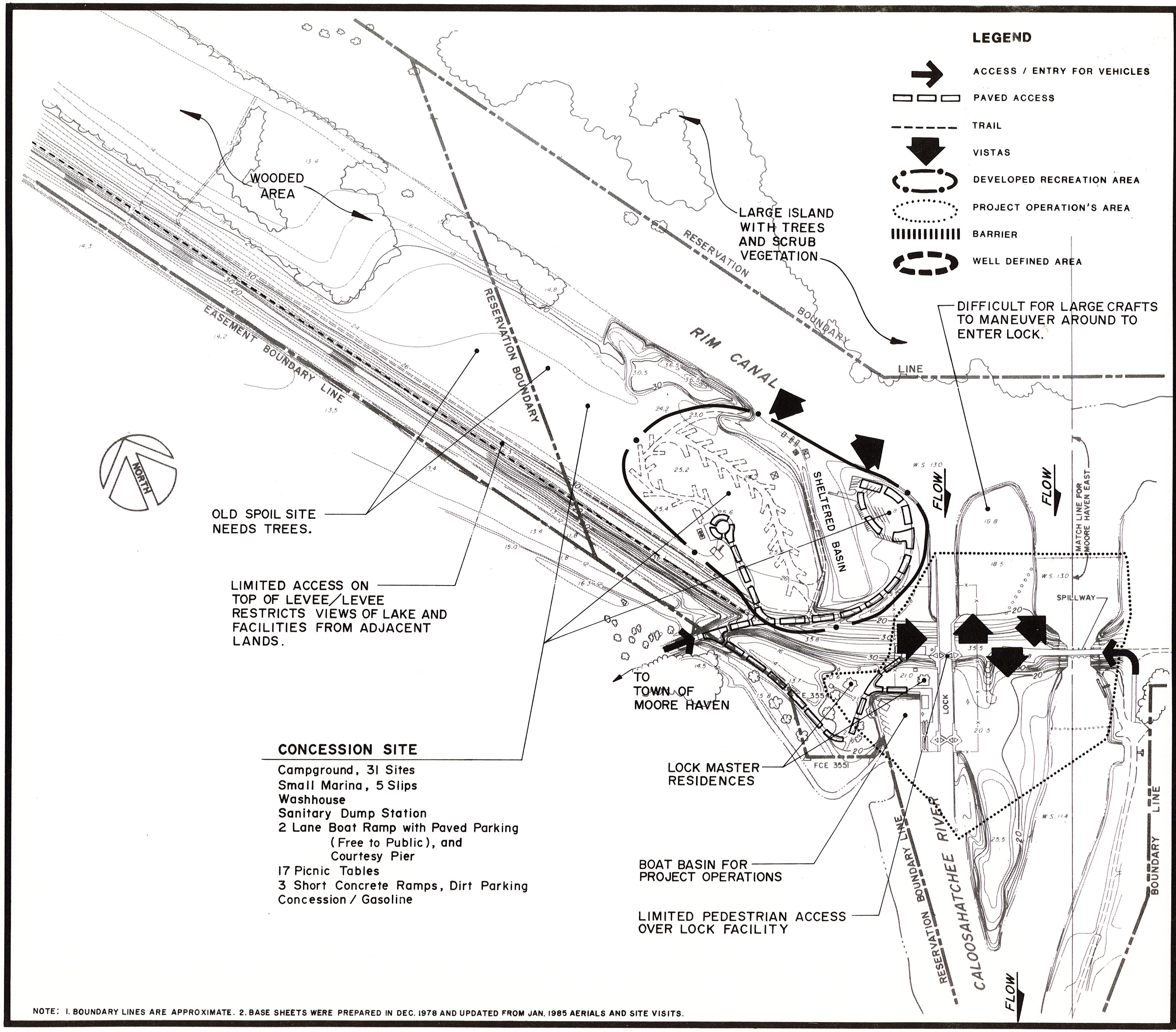

EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
SHELL
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
AS NOTED
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

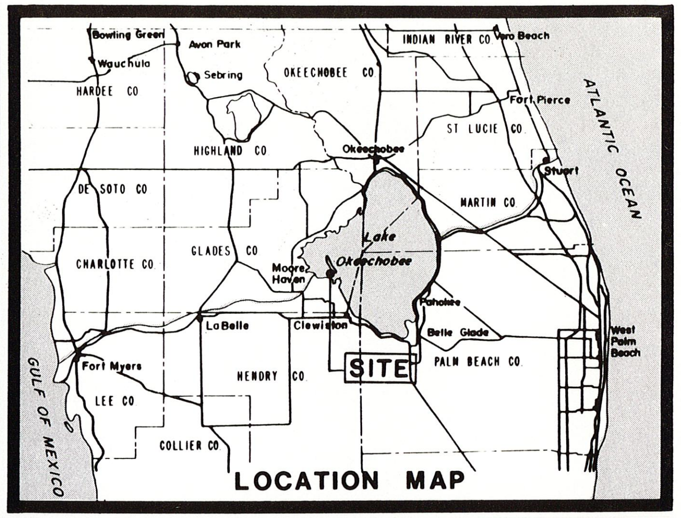
OKEECHOBEE PARK

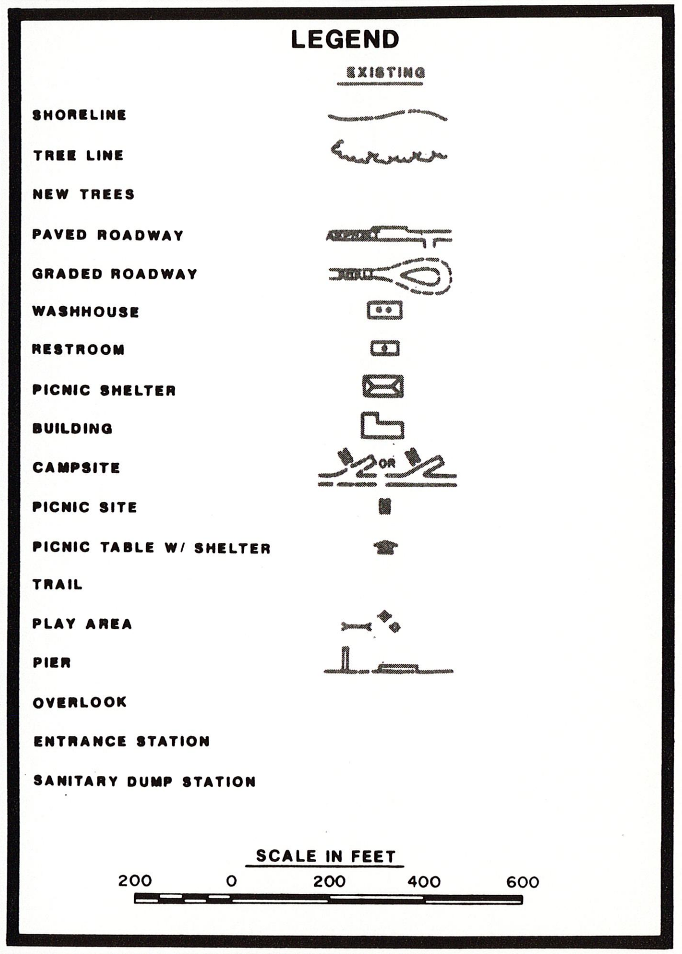
Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers
Jacksonville District


LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA
WOODED AREA
LARGE ISLAND WITH TREES AND SCRUB VEGETATION
RESERVATION BOUNDARY LINE
RIM CANAL
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY
NORTH
DIFFICULT FOR LARGE CRAFTS TO MANEUVER AROUND TO ENTER LOCK.
SHELTERED BASIN
FLOW
MATCH LINE FOR MOORE HAVEN EAST
OLD SPOIL SITE NEEDS TREES.
LIMITED ACCESS ON TOP OF LEVEE/LEVEE RESTRICTS VIEWS OF LAKE AND FACILITIES FROM ADJACENT LANDS.
SPILLWAY
LOCK
TO TOWN OF MOORE HAVEN
FCE 3551
LOCK MASTER RESIDENCES
BOAT BASIN FOR PROJECT OPERATIONS
LIMITED PEDESTRIAN ACCESS OVER LOCK FACILITY
RESERVATION BOUNDARY LINE
CALOOSAHATCHEE RIVER
BOUNDARY LINE
W.S. 13.0
W.S. 11.4
CONCESSION SITE
Campground, 31 Sites
Small Marina, 5 Slips
Washhouse
Sanitary Dump Station
2 Lane Boat Ramp with Paved Parking (Free to Public), and Courtesy Pier
17 Picnic Tables
3 Short Concrete Ramps, Dirt Parking
Concession / Gasoline

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


LOCATION MAP
Bowling Green
Avon Park
INDIAN RIVER CO
Vero Beach
Wauchula
Sebring
HARDEE CO
OKEECHOBEE CO
Fort Pierce
ATLANTIC OCEAN
HIGHLAND CO
Okeechobee
ST LUCIE CO
Stuart
DE SOTO CO
MARTIN CO
CHARLOTTE CO
GLADES CO
Lake Okeechobee
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO
SITE
PALM BEACH CO
GULF OF MEXICO
LEE CO
COLLIER CO

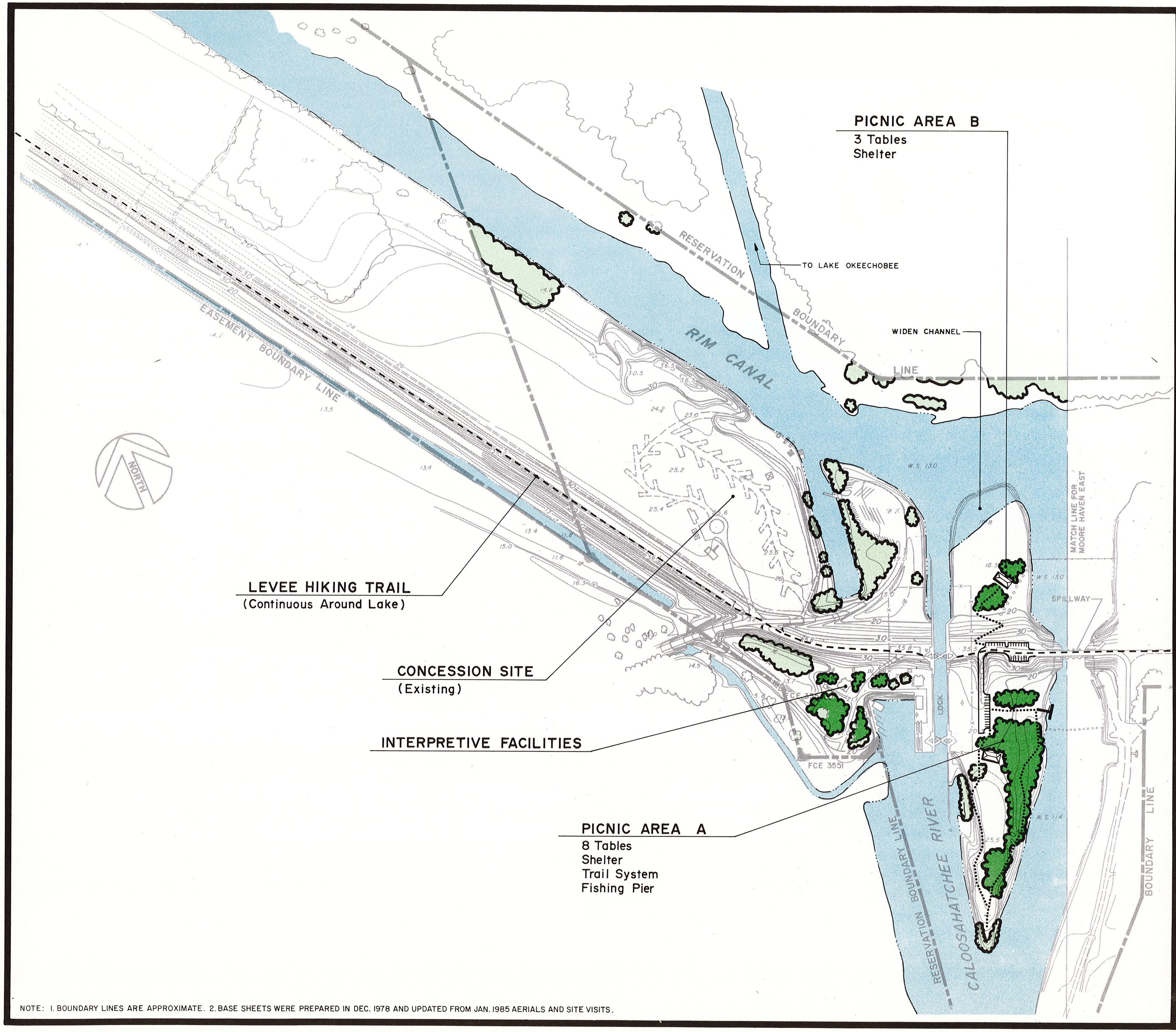

LEGEND
EXISTING
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Site Analysis

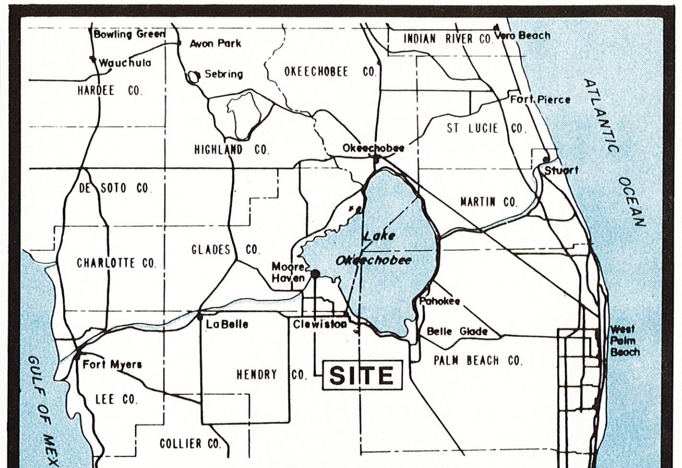
MOORE HAVEN RECREATION AREA, WEST

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers


PICNIC AREA B
3 Tables
Shelter
TO LAKE OKEECHOBEE
WIDEN CHANNEL
RESERVATION BOUNDARY LINE
RIM CANAL
EASEMENT BOUNDARY LINE
NORTH
LEVEE HIKING TRAIL
(Continuous Around Lake)
CONCESSION SITE
(Existing)
INTERPRETIVE FACILITIES
PICNIC AREA A
8 Tables
Shelter
Trail System
Fishing Pier
MATCH LINE FOR MOORE HAVEN EAST
SPILLWAY
LOCK
FCE 35.5
FCE 35.5
W.S. 13.0
W.S. 13.0
W.S. 11.4
RESERVATION BOUNDARY LINE
CALOOSAHATCHEE RIVER
BOUNDARY LINE

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
Stuart
ATLANTIC OCEAN
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
Lake Okeechobee
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO.
SITE
PALM BEACH CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

	EXISTING	PROPOSED
SHORELINE		
TREE LINE		
NEW TREES		
PAVED ROADWAY		
GRADED ROADWAY		
WASHHOUSE		
RESTROOM		
PICNIC SHELTER		
BUILDING		
CAMPSITE	OR	AS NOTED
PICNIC SITE		
PICNIC TABLE W/ SHELTER		
TRAIL		
PLAY AREA		
PIER		
OVERLOOK		
ENTRANCE STATION		
SANITARY DUMP STATION		

SCALE IN FEET

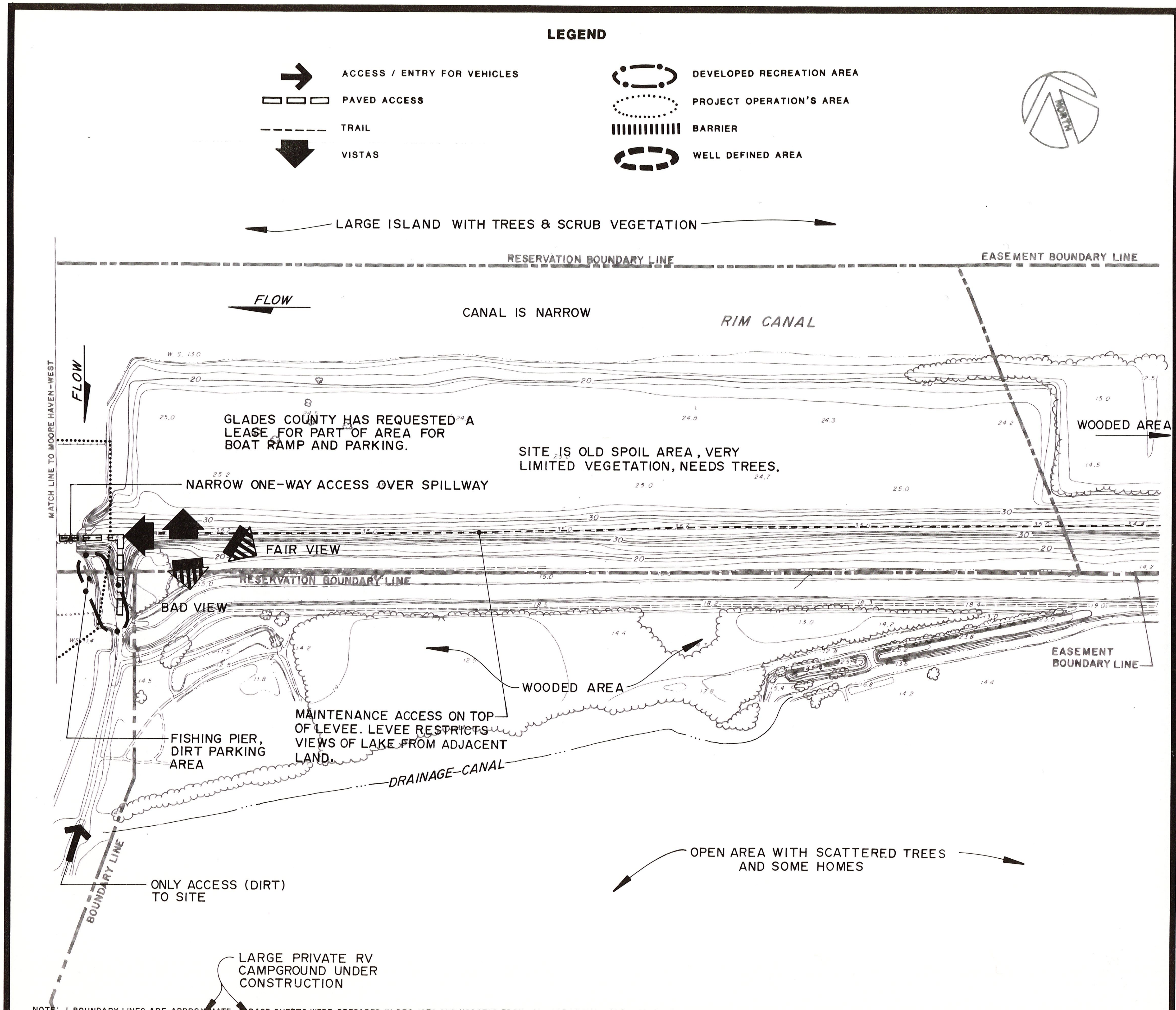
200 0 200 400 600

Conceptual Development Plan

MOORE HAVEN RECREATION AREA, WEST

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District


LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA
NORTH
LARGE ISLAND WITH TREES & SCRUB VEGETATION
RESERVATION BOUNDARY LINE
EASEMENT BOUNDARY LINE
FLOW
CANAL IS NARROW
RIM CANAL
MATCH LINE TO MOORE HAVEN-WEST
FLOW
GLADES COUNTY HAS REQUESTED A LEASE FOR PART OF AREA FOR BOAT RAMP AND PARKING.
SITE IS OLD SPOIL AREA, VERY LIMITED VEGETATION, NEEDS TREES.
WOODED AREA
NARROW ONE-WAY ACCESS OVER SPILLWAY
FAIR VIEW
RESERVATION BOUNDARY LINE
BAD VIEW
WOODED AREA
EASEMENT BOUNDARY LINE
MAINTENANCE ACCESS ON TOP OF LEVEE. LEVEE RESTRICTS VIEWS OF LAKE FROM ADJACENT LAND.
FISHING PIER, DIRT PARKING AREA
DRAINAGE-CANAL
OPEN AREA WITH SCATTERED TREES AND SOME HOMES
ONLY ACCESS (DIRT) TO SITE
BOUNDARY LINE
LARGE PRIVATE RV CAMPGROUND UNDER CONSTRUCTION

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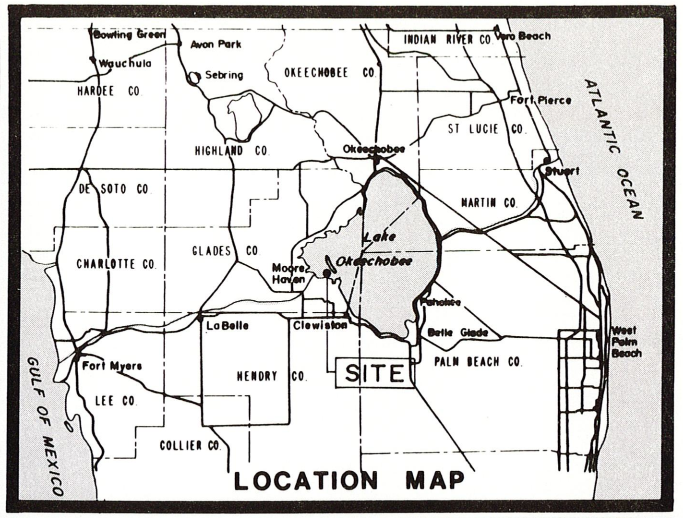
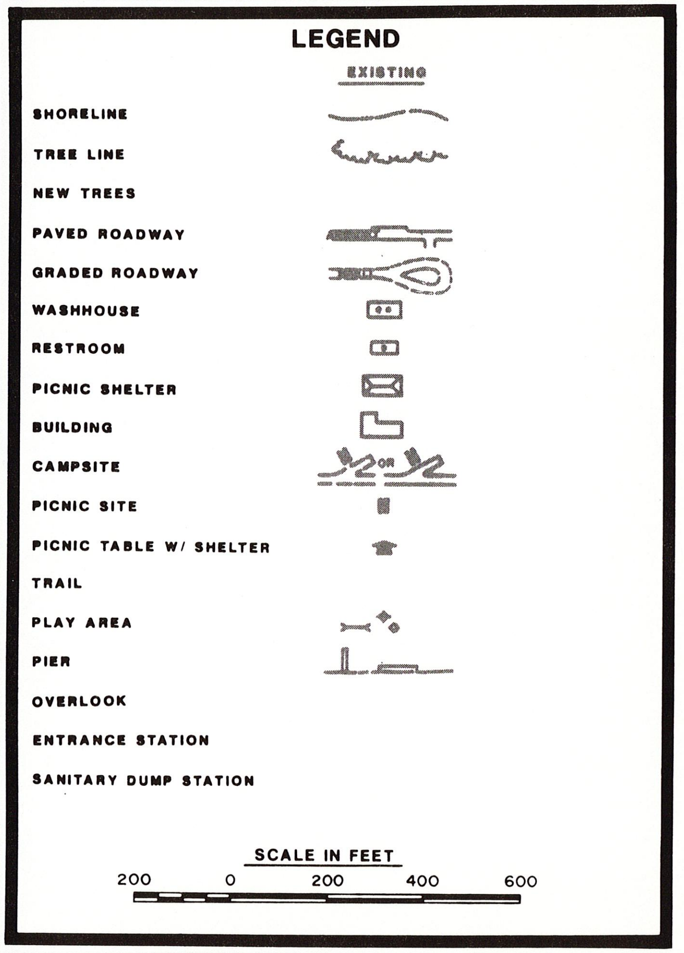

LOCATION MAP
Bowling Green
Wauchula
HARDEE CO
Avon Park
Sebring
HIGHLAND CO
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
ST LUCIE CO
Okeechobee
Stuart
MARTIN CO
ATLANTIC OCEAN
DE SOTO CO
CHARLOTTE CO
GLADES CO
Moore Haven
Lake Okeechobee
Pahokee
Belle Glade
West Palm Beach
PALM BEACH CO
LaBelle
Clewiston
HENDRY CO
SITE
Fort Myers
LEE CO
COLLIER CO
GULF OF MEXICO

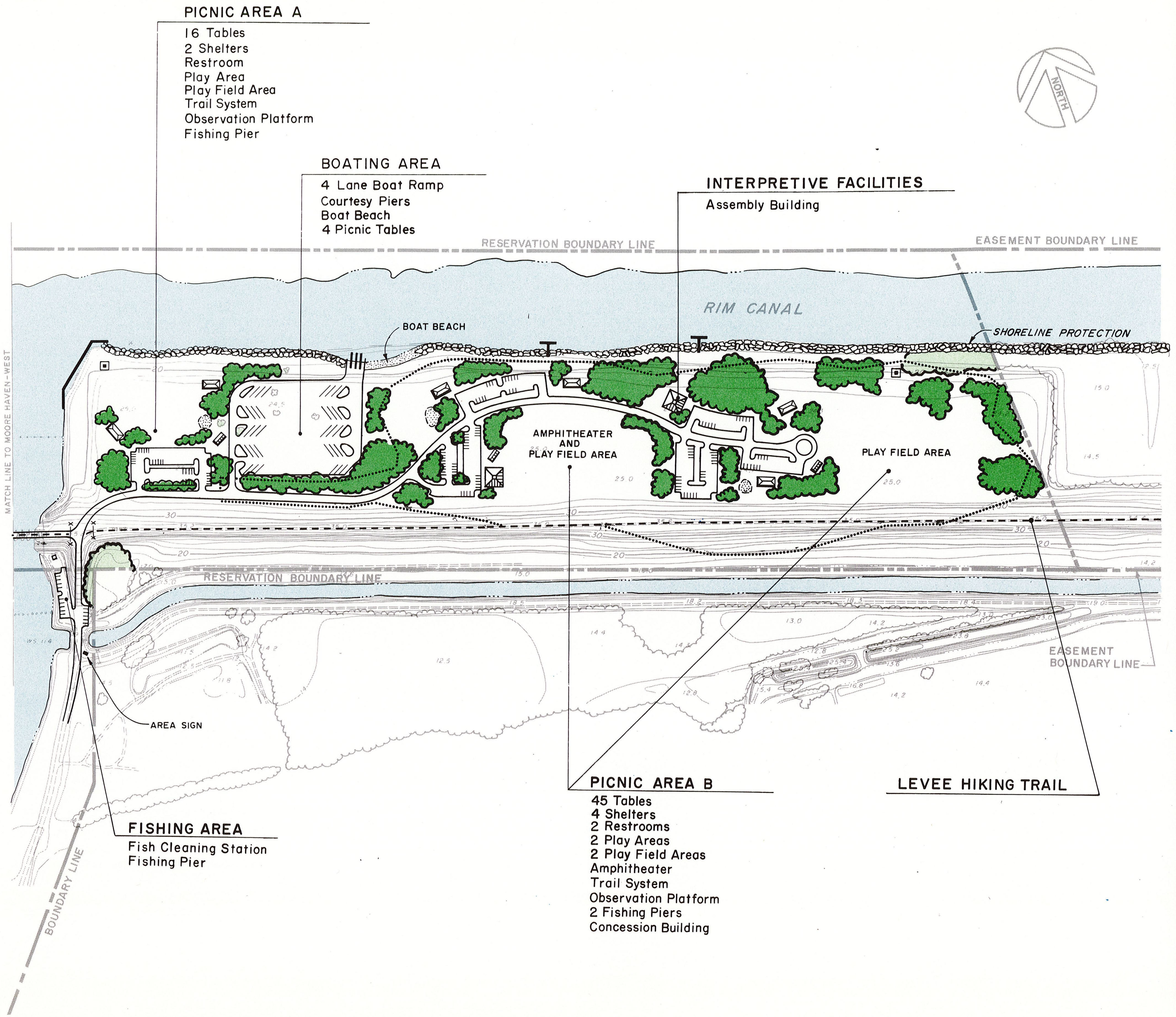

LEGEND
EXISTING
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Site Analysis

MOORE HAVEN RECREATION AREA, EAST

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers


RESERVATION BOUNDARY LINE
EASEMENT BOUNDARY LINE
RIM CANAL
BOAT BEACH
SHORELINE PROTECTION
AMPHITHEATER AND PLAY FIELD AREA
PLAY FIELD AREA
RESERVATION BOUNDARY LINE
EASEMENT BOUNDARY LINE
AREA SIGN
MATCH LINE TO MOORE HAVEN-WEST
BOUNDARY LINE
NORTH

PICNIC AREA A

- 16 Tables
- 2 Shelters
- Restroom
- Play Area
- Play Field Area
- Trail System
- Observation Platform
- Fishing Pier

BOATING AREA

- 4 Lane Boat Ramp
- Courtesy Piers
- Boat Beach
- 4 Picnic Tables

INTERPRETIVE FACILITIES

- Assembly Building

FISHING AREA

- Fish Cleaning Station
- Fishing Pier

PICNIC AREA B

- 45 Tables
- 4 Shelters
- 2 Restrooms
- 2 Play Areas
- 2 Play Field Areas
- Amphitheater
- Trail System
- Observation Platform
- 2 Fishing Piers
- Concession Building

LEVEE HIKING TRAIL

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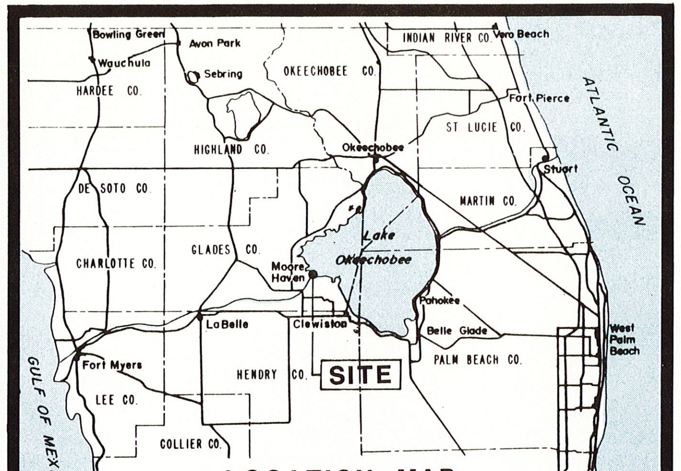
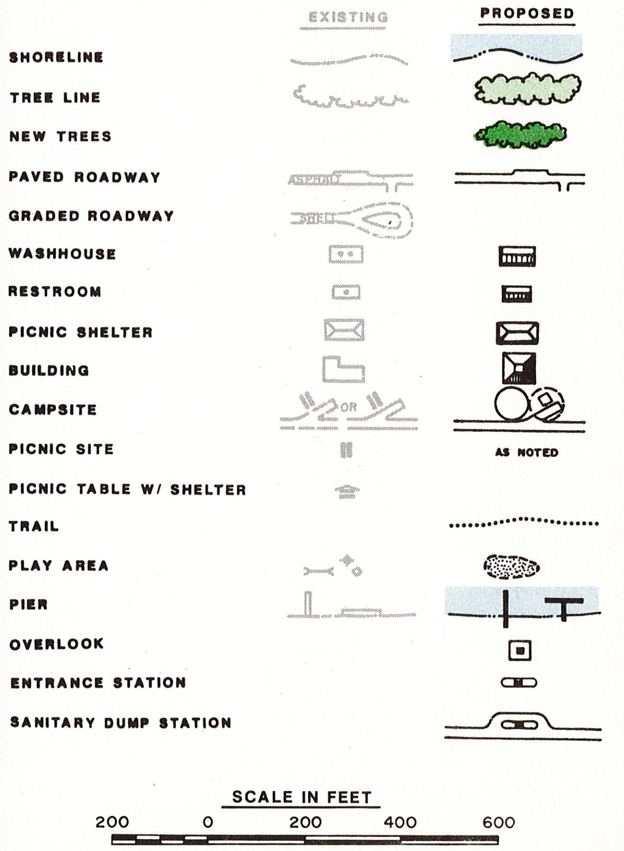

Bowling Green
Wauchula
Avon Park
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST. LUCIE CO.
ATLANTIC OCEAN
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
Lake Okeechobee
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO.
SITE
PALM BEACH CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

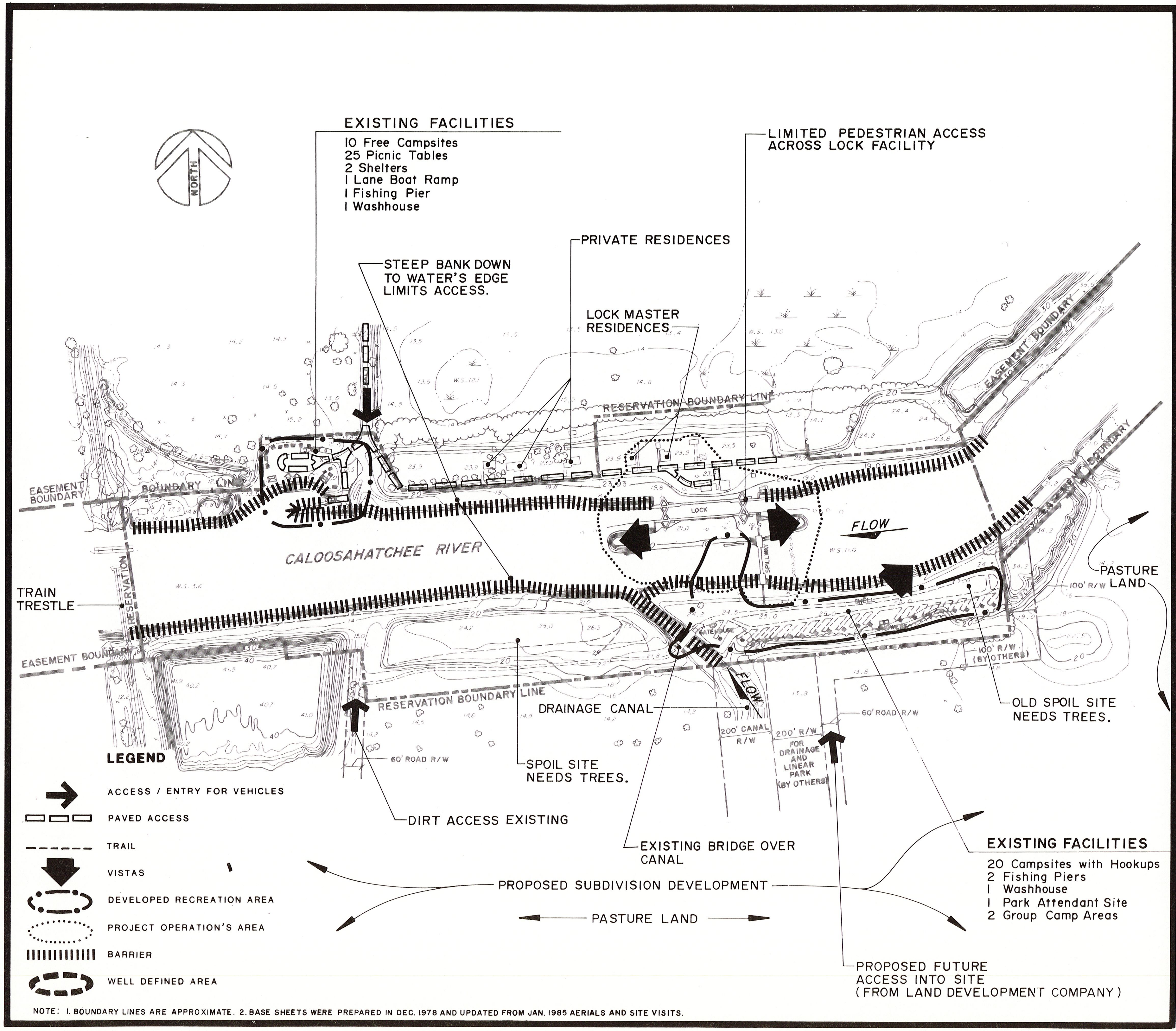

EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
AS NOTED
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

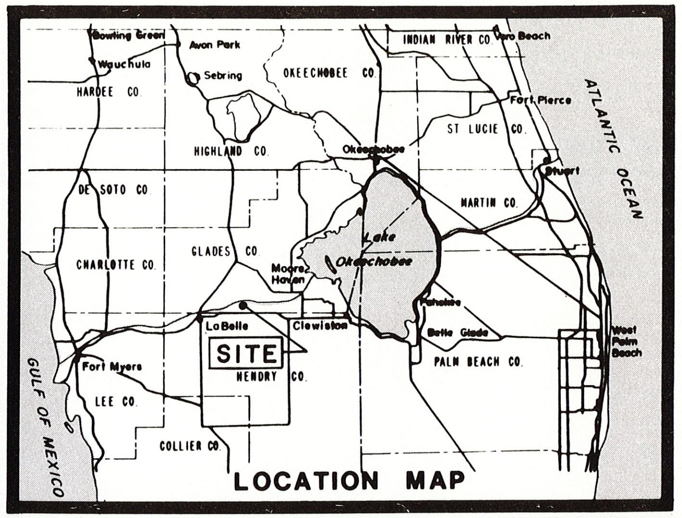
MOORE HAVEN RECREATION AREA, EAST

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District


NORTH
EXISTING FACILITIES
10 Free Campsites
25 Picnic Tables
2 Shelters
1 Lane Boat Ramp
1 Fishing Pier
1 Washhouse
LIMITED PEDESTRIAN ACCESS ACROSS LOCK FACILITY
PRIVATE RESIDENCES
STEEP BANK DOWN TO WATER'S EDGE LIMITS ACCESS.
LOCK MASTER RESIDENCES
RESERVATION BOUNDARY LINE
EASEMENT BOUNDARY
EASEMENT BOUNDARY
BOUNDARY LINE
LOCK
FLOW
CALOOSAHATCHEE RIVER
TRAIN TRESTLE
RESERVATION
SPILLWAY
GATEHOUSE
SHELL
PASTURE LAND
100' R/W
100' R/W (BY OTHERS)
EASEMENT BOUNDARY
RESERVATION BOUNDARY LINE
DRAINAGE CANAL
FLOW
60' ROAD R/W
200' CANAL R/W
200' R/W FOR DRAINAGE AND LINEAR PARK (BY OTHERS)
60' ROAD R/W
OLD SPOIL SITE NEEDS TREES.
SPOIL SITE NEEDS TREES.
DIRT ACCESS EXISTING
EXISTING BRIDGE OVER CANAL
EXISTING FACILITIES
20 Campsites with Hookups
2 Fishing Piers
1 Washhouse
1 Park Attendant Site
2 Group Camp Areas
PROPOSED SUBDIVISION DEVELOPMENT
PASTURE LAND
PROPOSED FUTURE ACCESS INTO SITE (FROM LAND DEVELOPMENT COMPANY)
LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Wauchula
Avon Park
Sebring
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
HARDEE CO
ST LUCIE CO
ATLANTIC OCEAN
HIGHLAND CO
Okeechobee
Stuart
DE SOTO CO
MARTIN CO
Lake Okeechobee
CHARLOTTE CO
GLADES CO
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
SITE
HENDRY CO
PALM BEACH CO
LEE CO
GULF OF MEXICO
COLLIER CO

LOCATION MAP

LEGEND

EXISTING

- SHORELINE
- TREE LINE
- NEW TREES
- PAVED ROADWAY
- GRADED ROADWAY
- WASHHOUSE
- RESTROOM
- PICNIC SHELTER
- BUILDING
- CAMPSITE
- PICNIC SITE
- PICNIC TABLE W/ SHELTER
- TRAIL
- PLAY AREA
- PIER
- OVERLOOK
- ENTRANCE STATION
- SANITARY DUMP STATION

SCALE IN FEET
200 0 200 400 600

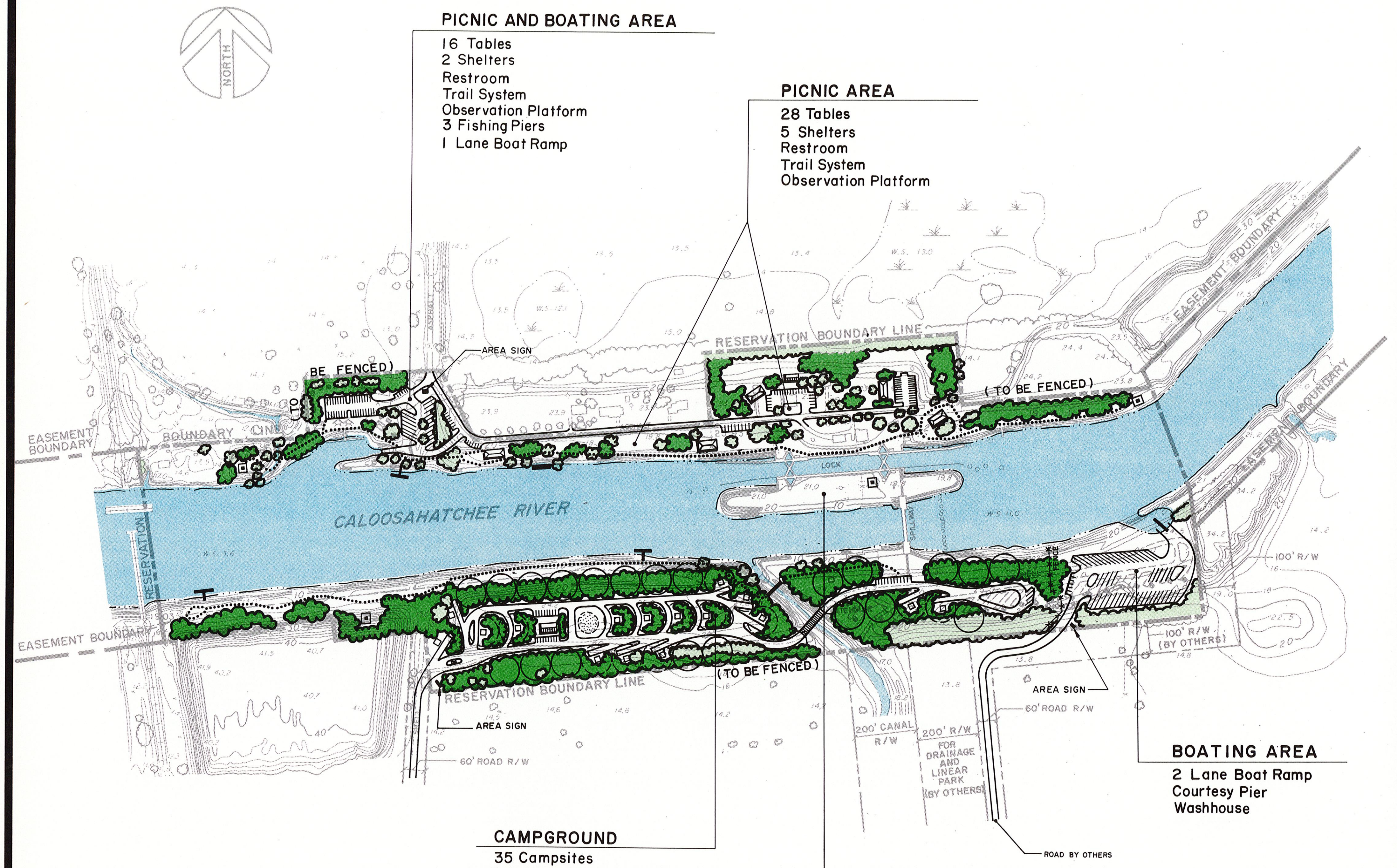
Site Analysis

ORTONA RECREATION AREA, NORTH and SOUTH

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers

PLATE 7A


NORTH
CALOOSAHATCHEE RIVER
RESERVATION BOUNDARY LINE
BOUNDARY LINE
EASEMENT BOUNDARY
EASEMENT BOUNDARY
RESERVATION
(TO BE FENCED)
AREA SIGN
ASPHALT
LOCK
100' R/W
100' R/W (BY OTHERS)
60' ROAD R/W
200' CANAL R/W
200' R/W FOR DRAINAGE AND LINEAR PARK (BY OTHERS)
ROAD BY OTHERS

PICNIC AND BOATING AREA
16 Tables
2 Shelters
Restroom
Trail System
Observation Platform
3 Fishing Piers
1 Lane Boat Ramp

PICNIC AREA
28 Tables
5 Shelters
Restroom
Trail System
Observation Platform

CAMPGROUND
35 Campsites
Entrance Station with Gate
2 Park Attendant Sites
Washhouse
Sanitary Dump Station
Play Area
Observation Platform
3 Fishing Piers
Trail System

INTERPRETIVE FACILITIES
2 Picnic Tables
Observation Platform
Fishing Pier

BOATING AREA
2 Lane Boat Ramp
Courtesy Pier
Washhouse

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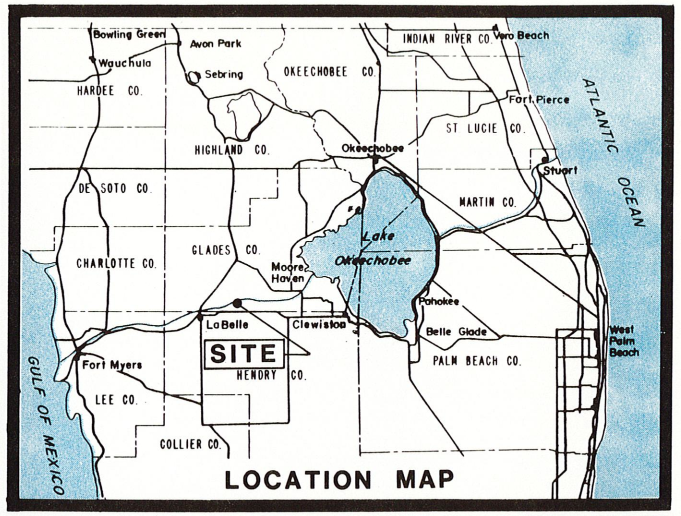
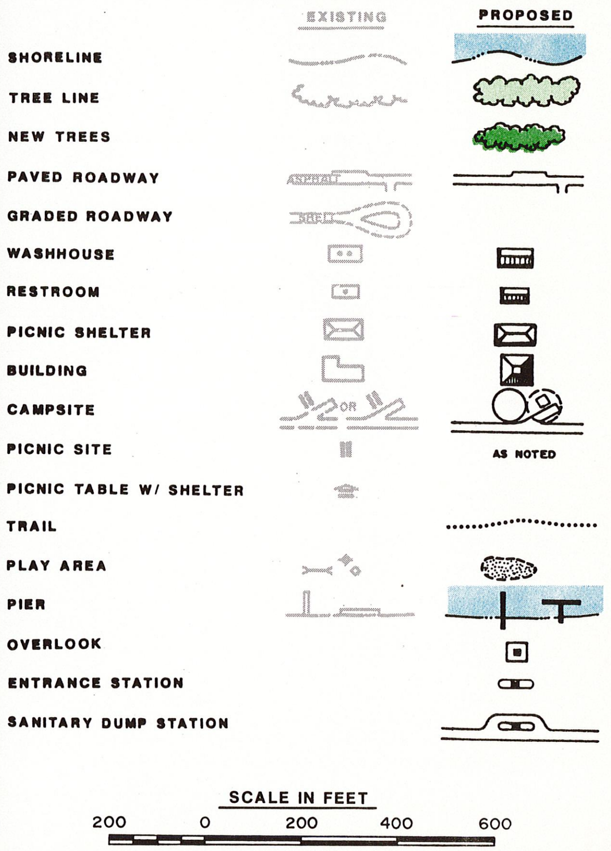

Bowling Green
Wauchula
Avon Park
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
SITE
HENDRY CO.
Fort Myers
LEE CO.
PALM BEACH CO.
West Palm Beach
COLLIER CO.
GULF OF MEXICO
ATLANTIC OCEAN

LOCATION MAP

LEGEND

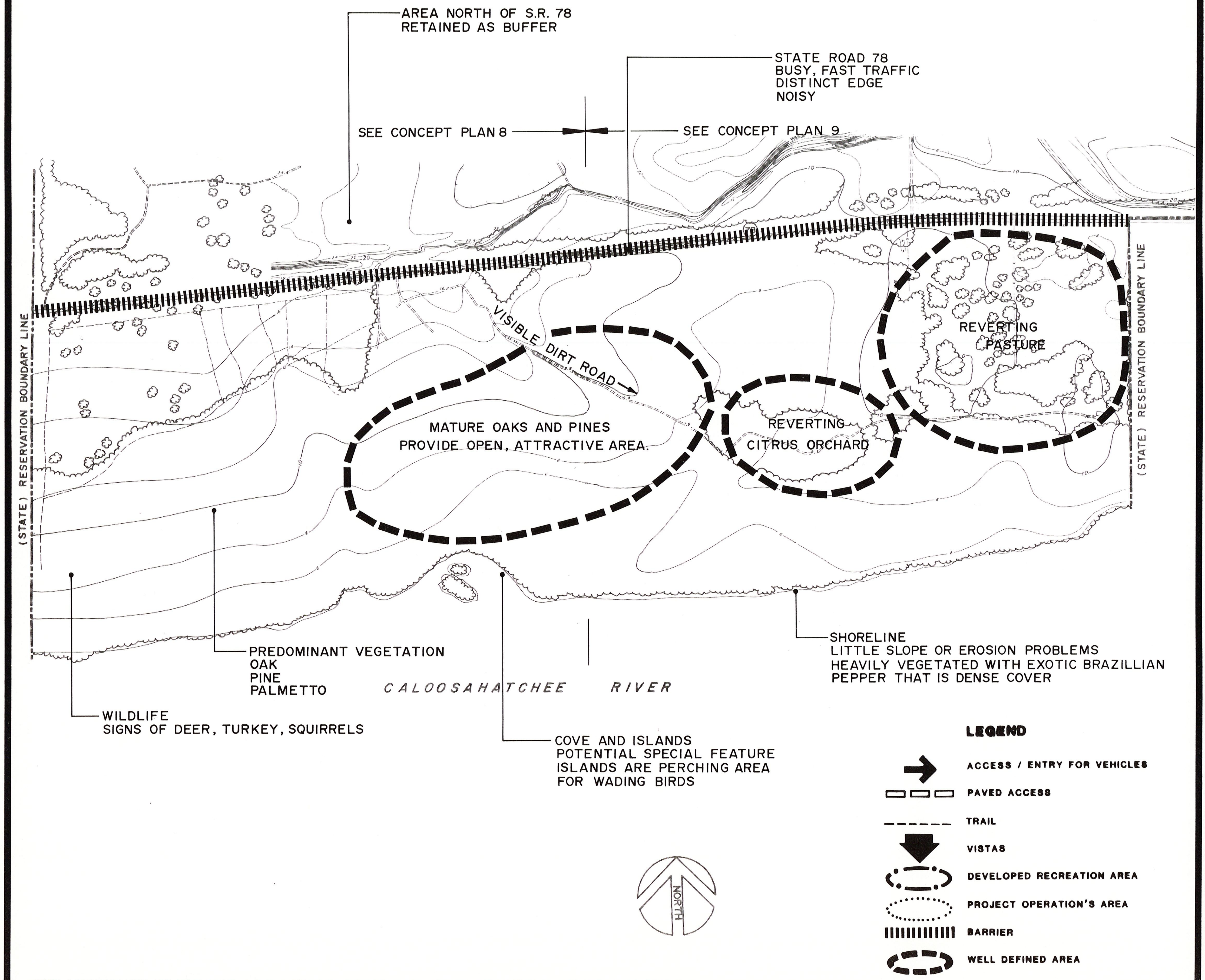

EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
AS NOTED
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

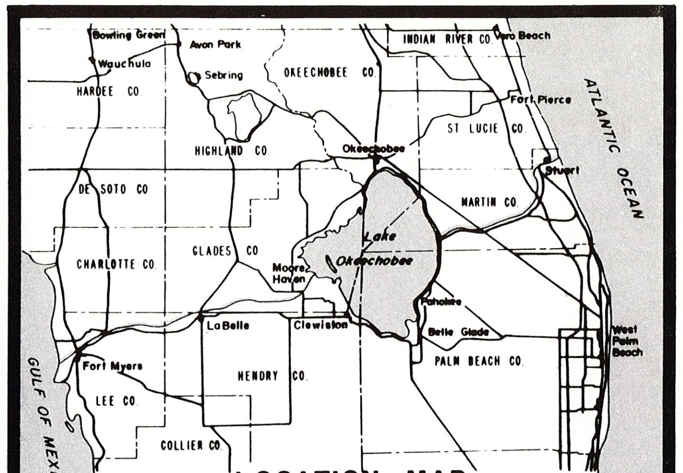
ORTONA RECREATION AREA, NORTH and SOUTH

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District


AREA NORTH OF S.R. 78
RETAINED AS BUFFER
STATE ROAD 78
BUSY, FAST TRAFFIC
DISTINCT EDGE
NOISY
SEE CONCEPT PLAN 8
SEE CONCEPT PLAN 9
VISIBLE DIRT ROAD
(STATE) RESERVATION BOUNDARY LINE
(STATE) RESERVATION BOUNDARY LINE
REVERTING PASTURE
MATURE OAKS AND PINES
PROVIDE OPEN, ATTRACTIVE AREA.
REVERTING
CITRUS ORCHARD
PREDOMINANT VEGETATION
OAK
PINE
PALMETTO
CALOOSAHATCHEE RIVER
SHORELINE
LITTLE SLOPE OR EROSION PROBLEMS
HEAVILY VEGETATED WITH EXOTIC BRAZILLIAN
PEPPER THAT IS DENSE COVER
WILDLIFE
SIGNS OF DEER, TURKEY, SQUIRRELS
COVE AND ISLANDS
POTENTIAL SPECIAL FEATURE
ISLANDS ARE PERCHING AREA
FOR WADING BIRDS
NORTH
LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA

NOTE: I. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
ATLANTIC OCEAN
ST LUCIE CO
HIGHLAND CO
Okeechobee
Stuart
DE SOTO CO
MARTIN CO
Lake Okeechobee
GLADES CO
CHARLOTTE CO
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
PALM BEACH CO
HENDRY CO
LEE CO
GULF OF MEXICO
COLLIER CO

LOCATION MAP

LEGEND

SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION

SCALE IN FEET
200 0 200 400 600

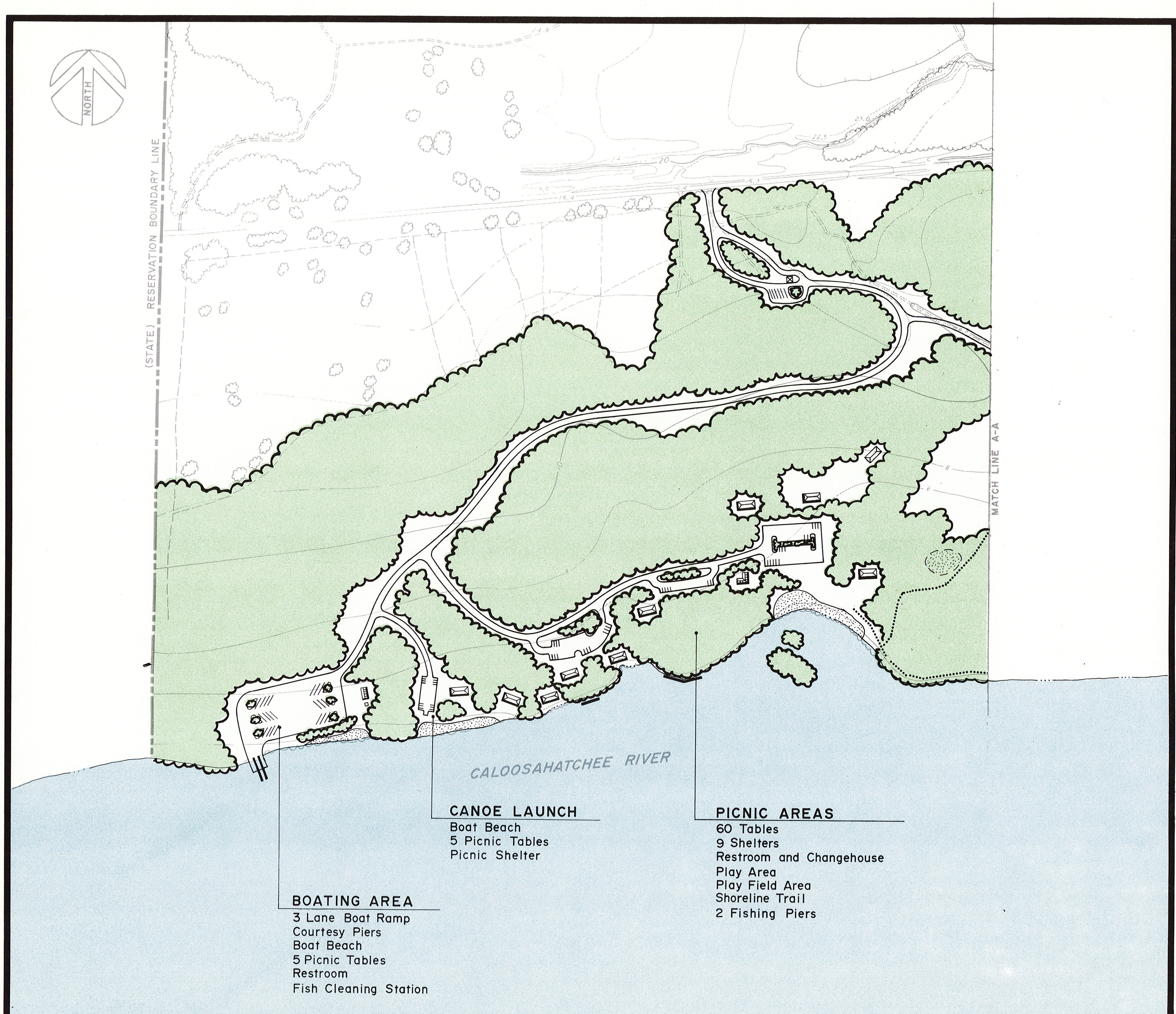
Site Analysis

CALOOSAHATCHEE RIVER STATE PARK

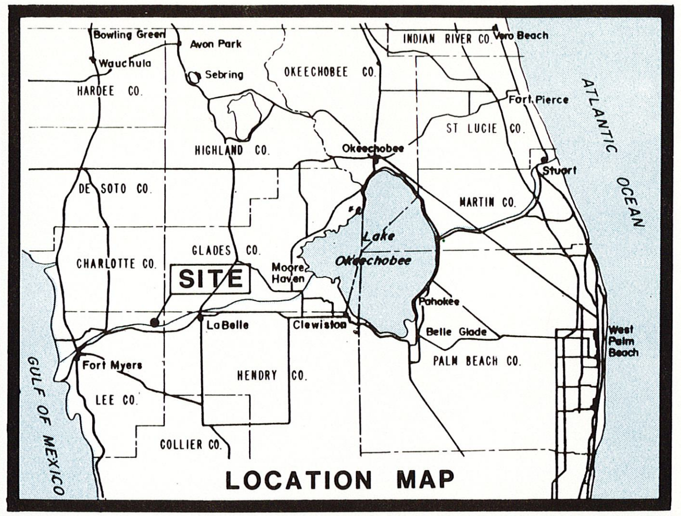
Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

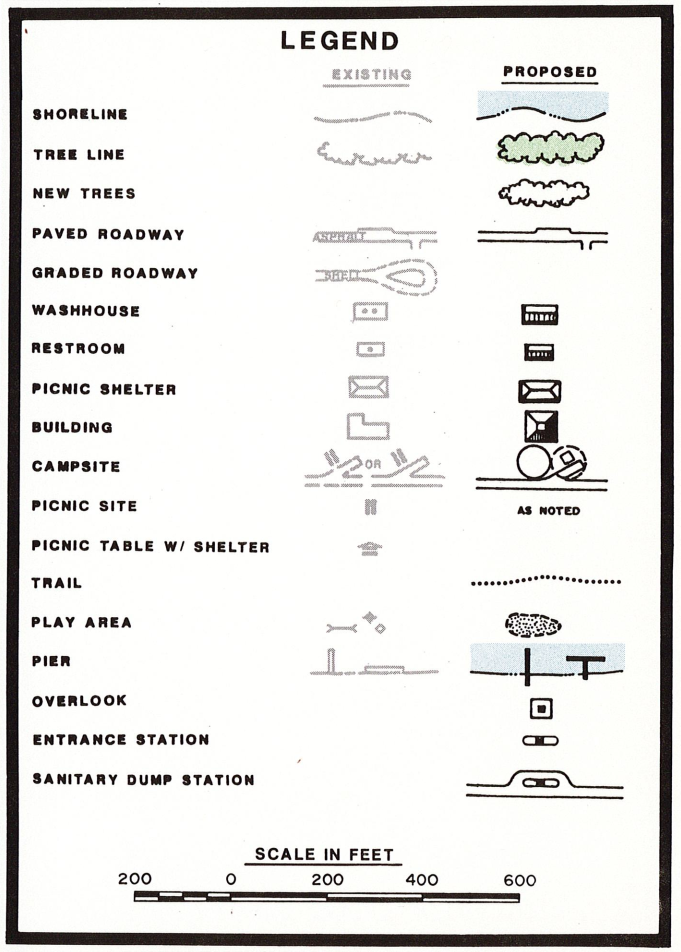
US Army Corps
of Engineers

PLATE 8A AND PLATE 9A


NORTH
(STATE) RESERVATION BOUNDARY LINE
MATCH LINE A-A
CALOOSAHATCHEE RIVER
BOATING AREA
3 Lane Boat Ramp
Courtesy Piers
Boat Beach
5 Picnic Tables
Restroom
Fish Cleaning Station
CANOE LAUNCH
Boat Beach
5 Picnic Tables
Picnic Shelter
PICNIC AREAS
60 Tables
9 Shelters
Restroom and Changehouse
Play Area
Play Field Area
Shoreline Trail
2 Fishing Piers

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
SITE
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
PALM BEACH CO.
Fort Myers
HENDRY CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION MAP

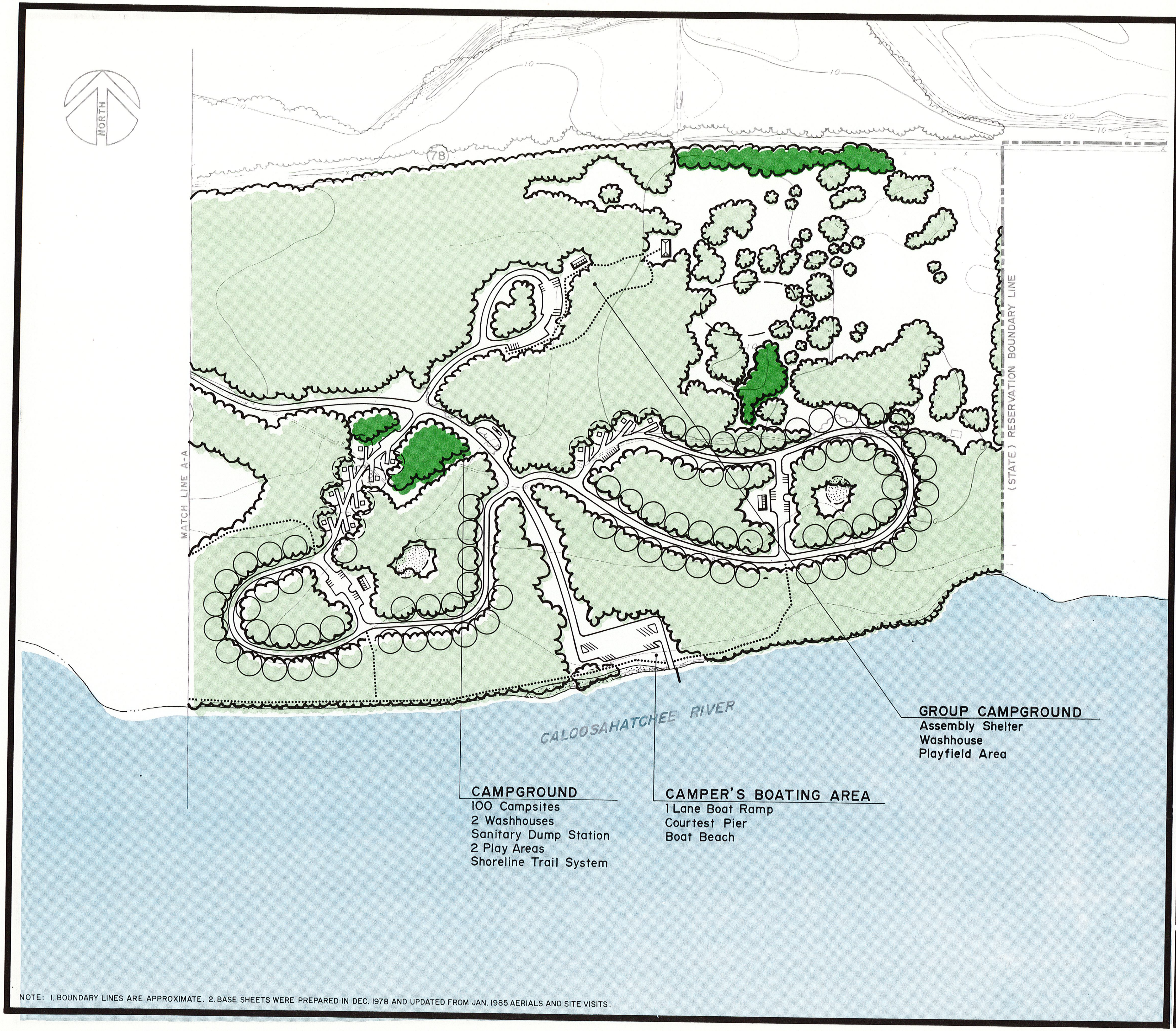

LEGEND
EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
SHELL
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
AS NOTED
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

CALOOSAHATCHEE RIVER
STATE PARK

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers
Jacksonville District

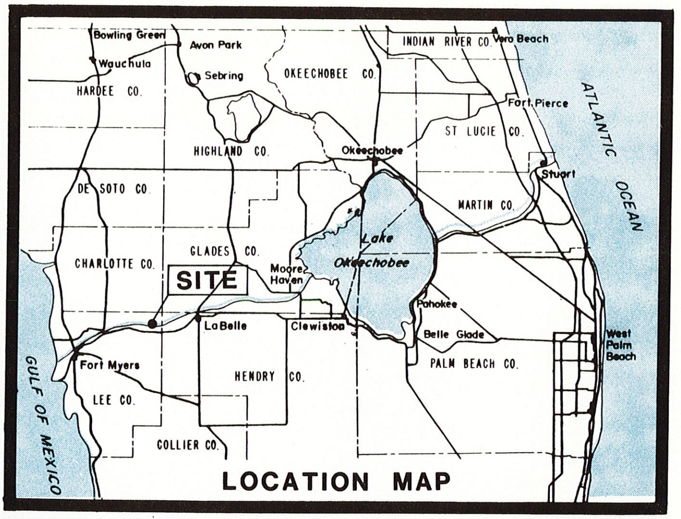

NORTH
78
MATCH LINE A-A
(STATE) RESERVATION BOUNDARY LINE
CALOOSAHATCHEE RIVER
10
20

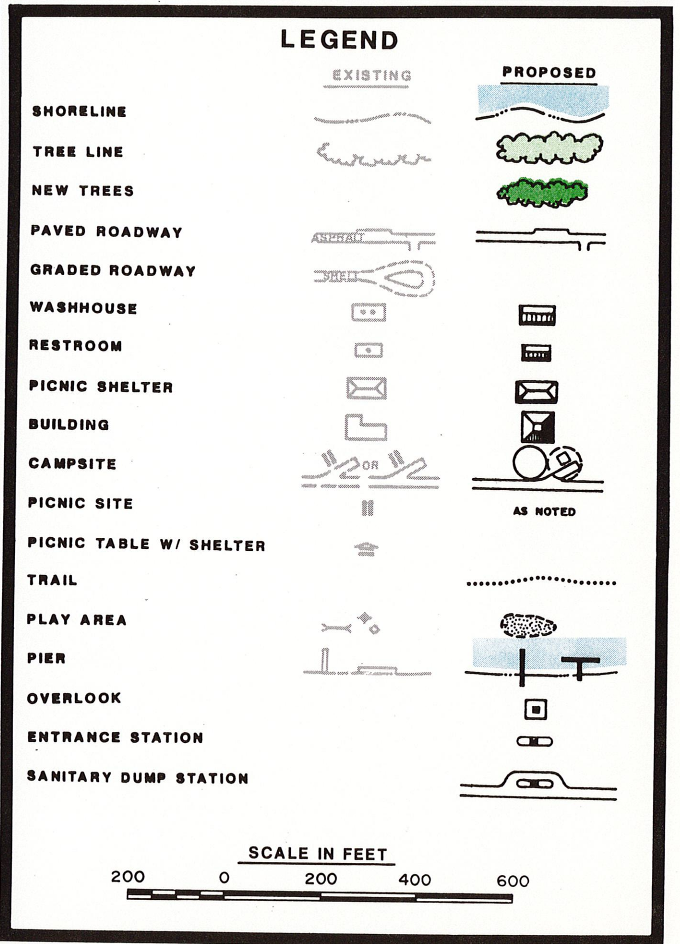
CAMPGROUND
100 Campsites
2 Washhouses
Sanitary Dump Station
2 Play Areas
Shoreline Trail System

CAMPER'S BOATING AREA
1 Lane Boat Ramp
Courtest Pier
Boat Beach

GROUP CAMPGROUND
Assembly Shelter
Washhouse
Playfield Area

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Wauchula
HARDEE CO.
Avon Park
Sebring
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
ATLANTIC OCEAN
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
CHARLOTTE CO.
GLADES CO.
SITE
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
PALM BEACH CO.
Fort Myers
HENDRY CO.
LEE CO.
GULF OF MEXICO
COLLIER CO.
LOCATION MAP

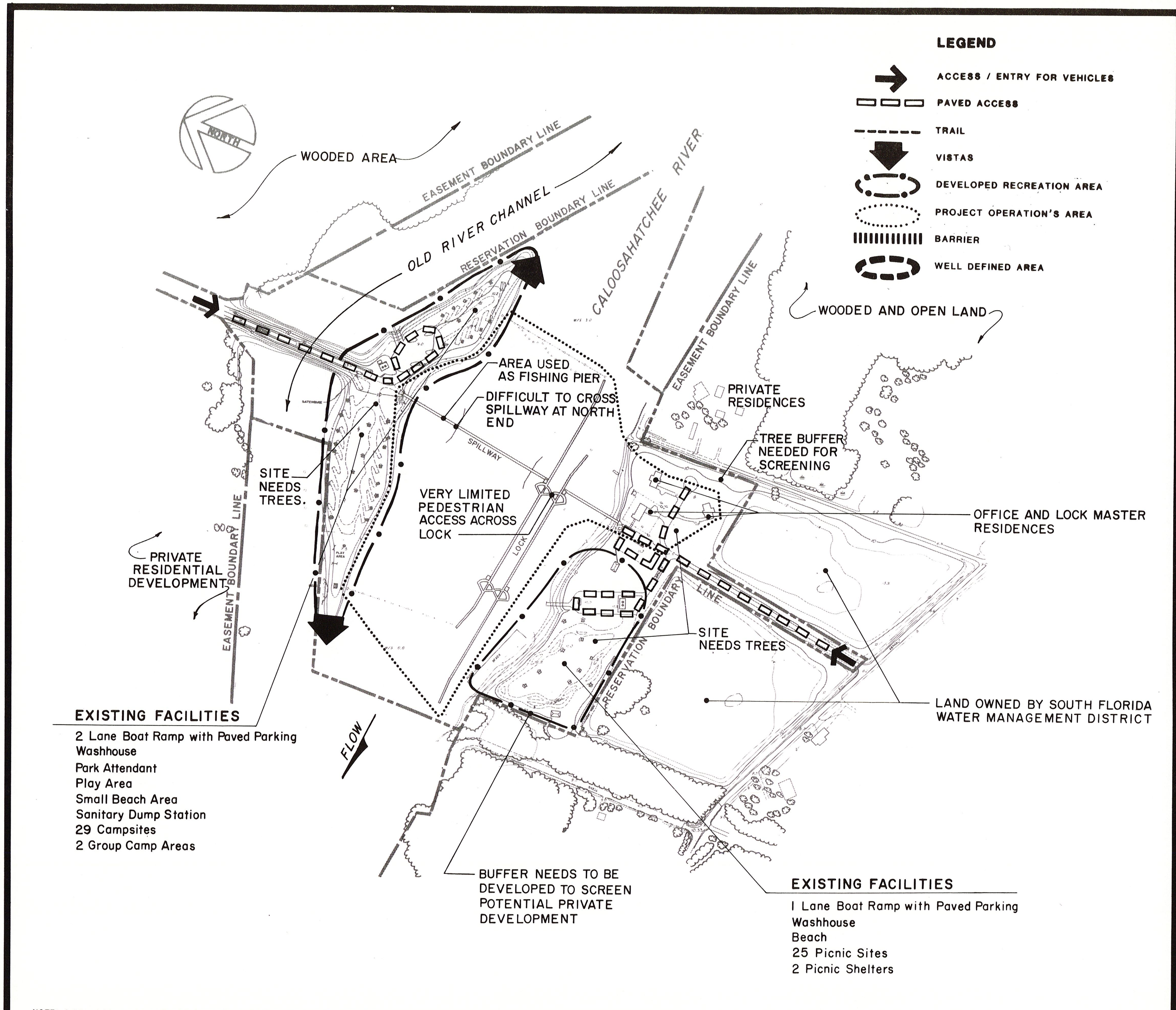

LEGEND
EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
ASPHALT
GRADED ROADWAY
SHELL
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
AS NOTED
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

CALOOSAHATCHEE RIVER
STATE PARK

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps
of Engineers
Jacksonville District


WOODED AREA
EASEMENT BOUNDARY LINE
OLD RIVER CHANNEL
RESERVATION BOUNDARY LINE
CALOOSAHATCHEE RIVER
EASEMENT BOUNDARY LINE
WOODED AND OPEN LAND
AREA USED AS FISHING PIER
DIFFICULT TO CROSS SPILLWAY AT NORTH END
SPILLWAY
PRIVATE RESIDENCES
TREE BUFFER NEEDED FOR SCREENING
SITE NEEDS TREES.
VERY LIMITED PEDESTRIAN ACCESS ACROSS LOCK
LOCK
OFFICE AND LOCK MASTER RESIDENCES
PRIVATE RESIDENTIAL DEVELOPMENT
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY LINE
SITE NEEDS TREES
LAND OWNED BY SOUTH FLORIDA WATER MANAGEMENT DISTRICT
FLOW
NORTH
BUFFER NEEDS TO BE DEVELOPED TO SCREEN POTENTIAL PRIVATE DEVELOPMENT

LEGEND

- ➔ ACCESS / ENTRY FOR VEHICLES
- ▭▭▭ PAVED ACCESS
- – – – – TRAIL
- ⬇ VISTAS
- DEVELOPED RECREATION AREA
- PROJECT OPERATION'S AREA
- ||||||||||| BARRIER
- WELL DEFINED AREA

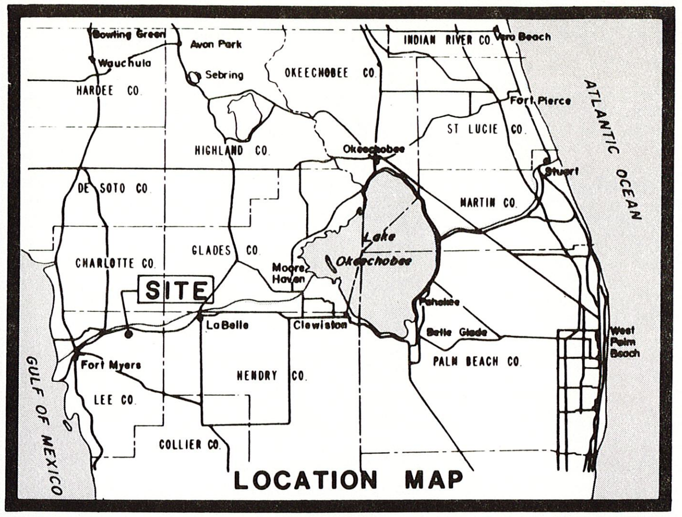
EXISTING FACILITIES

2 Lane Boat Ramp with Paved Parking
Washhouse
Park Attendant
Play Area
Small Beach Area
Sanitary Dump Station
29 Campsites
2 Group Camp Areas

EXISTING FACILITIES

1 Lane Boat Ramp with Paved Parking
Washhouse
Beach
25 Picnic Sites
2 Picnic Shelters

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO
OKEECHOBEE CO
INDIAN RIVER CO
Vero Beach
Fort Pierce
ST LUCIE CO
ATLANTIC OCEAN
HIGHLAND CO
Okeechobee
Stuart
DE SOTO CO
MARTIN CO
GLADES CO
Lake Okeechobee
CHARLOTTE CO
Moore Haven
SITE
LaBelle
Clewiston
Pahokee
Belle Glade
West Palm Beach
PALM BEACH CO
Fort Myers
HENDRY CO
LEE CO
GULF OF MEXICO
COLLIER CO

LOCATION MAP

LEGEND

EXISTING

SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION

SCALE IN FEET
200 0 200 400 600

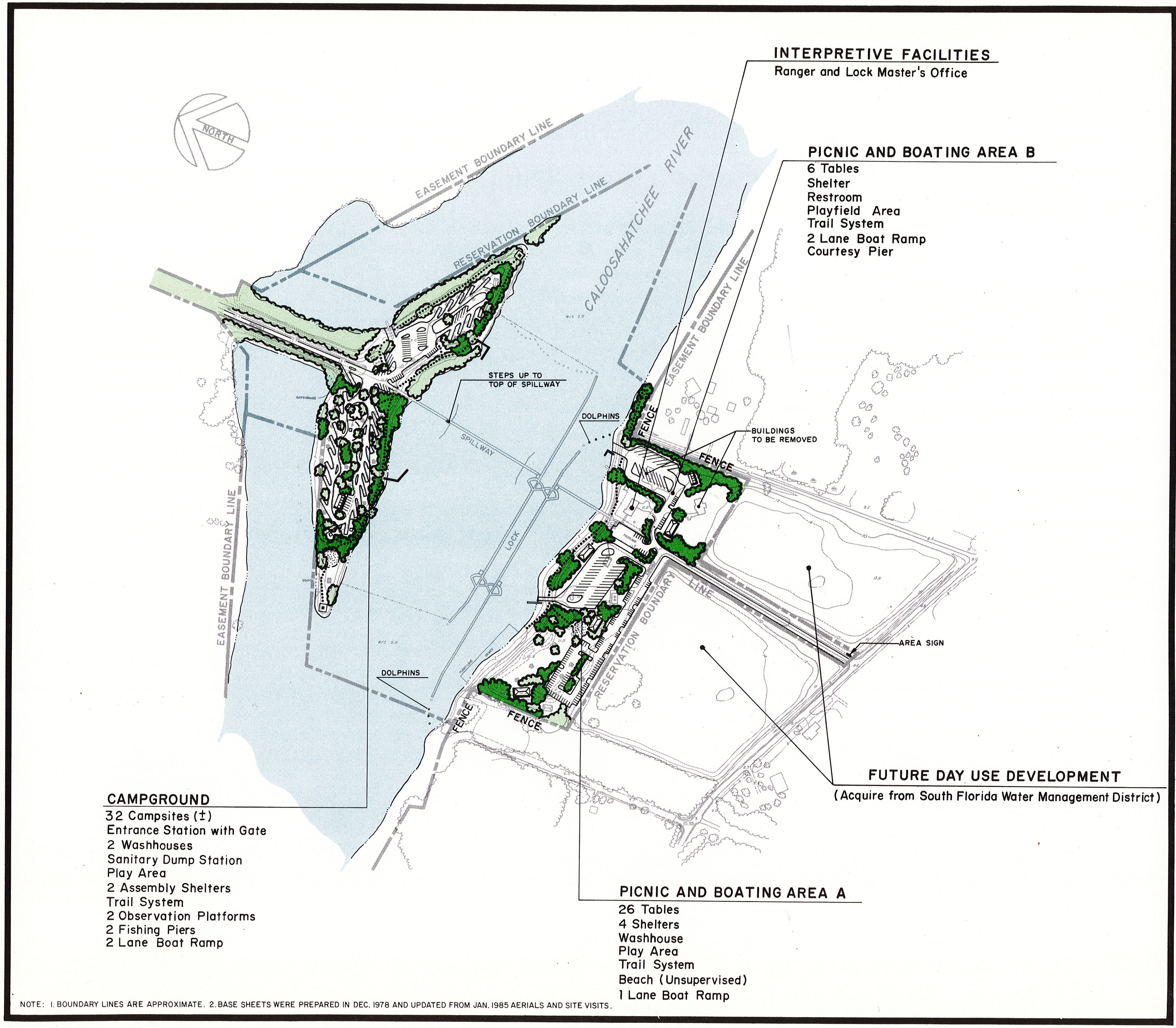
Site Analysis

W.P. FRANKLIN RECREATION AREA, NORTH and SOUTH

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers

PLATE 10A


NORTH
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY LINE
CALOOSAHATCHEE RIVER
EASEMENT BOUNDARY LINE
STEPS UP TO TOP OF SPILLWAY
SPILLWAY
LOCK
DOLPHINS
DOLPHINS
FENCE
FENCE
FENCE
FENCE
BUILDINGS TO BE REMOVED
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY LINE
AREA SIGN

INTERPRETIVE FACILITIES
Ranger and Lock Master's Office

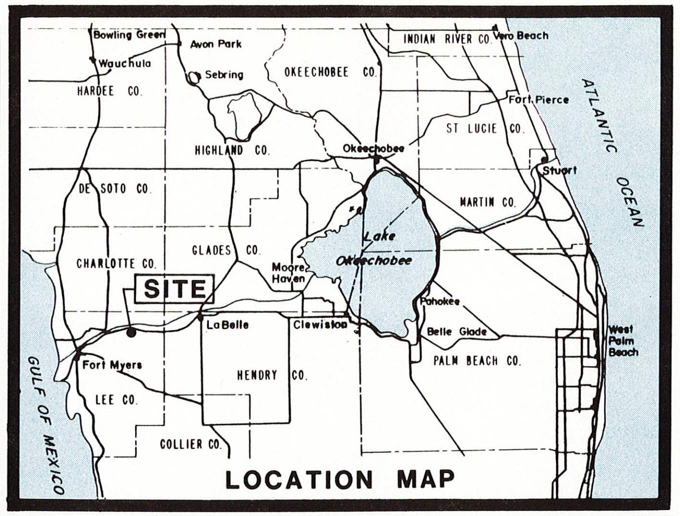
PICNIC AND BOATING AREA B
6 Tables
Shelter
Restroom
Playfield Area
Trail System
2 Lane Boat Ramp
Courtesy Pier

CAMPGROUND
32 Campsites (±)
Entrance Station with Gate
2 Washhouses
Sanitary Dump Station
Play Area
2 Assembly Shelters
Trail System
2 Observation Platforms
2 Fishing Piers
2 Lane Boat Ramp

FUTURE DAY USE DEVELOPMENT
(Acquire from South Florida Water Management District)

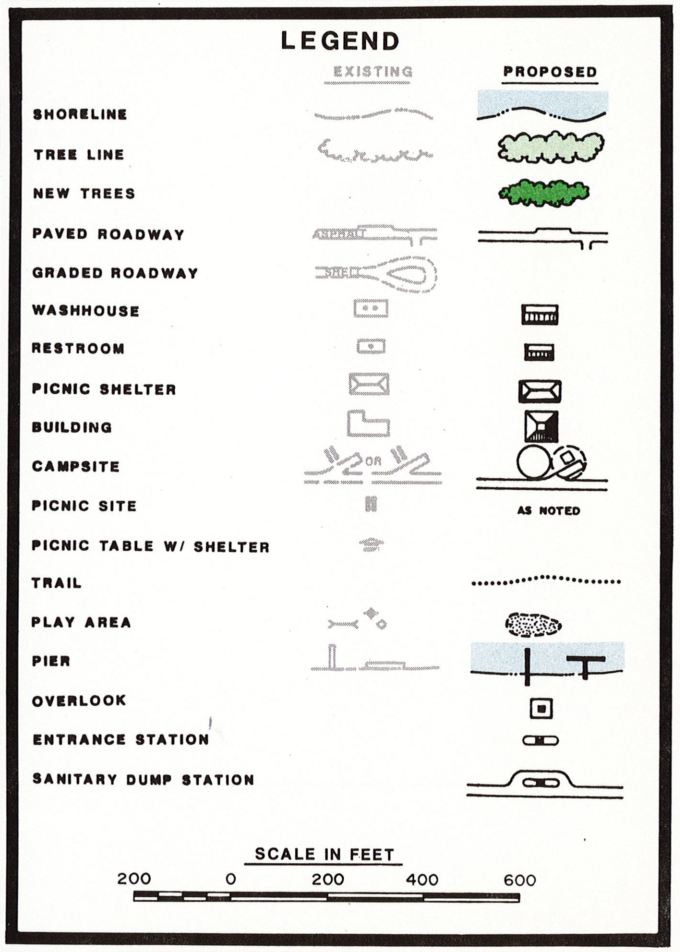
PICNIC AND BOATING AREA A
26 Tables
4 Shelters
Washhouse
Play Area
Trail System
Beach (Unsupervised)
1 Lane Boat Ramp

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
HIGHLAND CO.
Okeechobee
Stuart
ATLANTIC OCEAN
DE SOTO CO.
MARTIN CO.
Lake Okeechobee
GLADES CO.
CHARLOTTE CO.
Moore Haven
SITE
LaBelle
Clewiston
Pahokee
Belle Glade
West Palm Beach
PALM BEACH CO.
Fort Myers
HENDRY CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

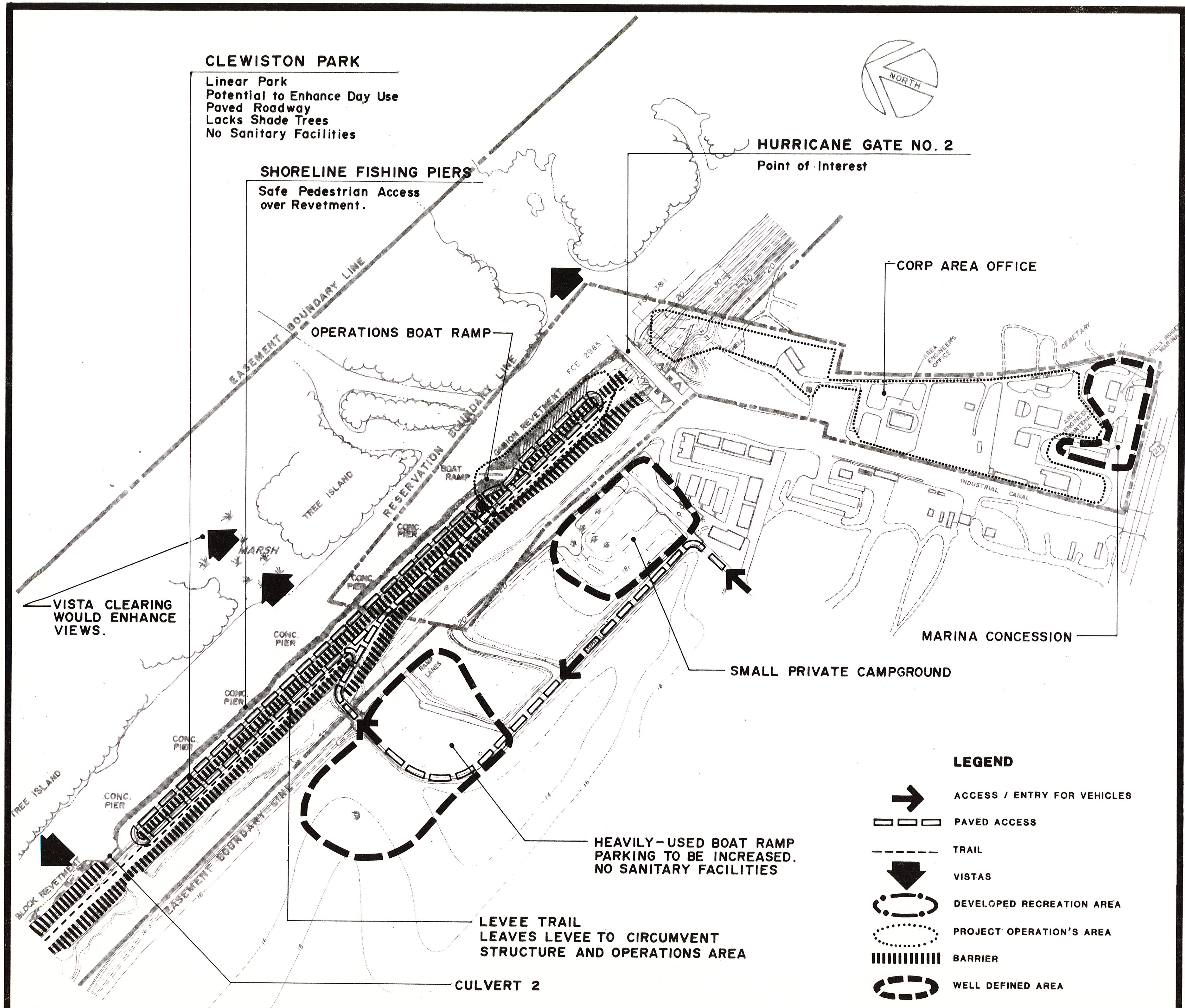

EXISTING
PROPOSED
SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
OR
PICNIC SITE
AS NOTED
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION
SCALE IN FEET
200
0
200
400
600

Conceptual Development Plan

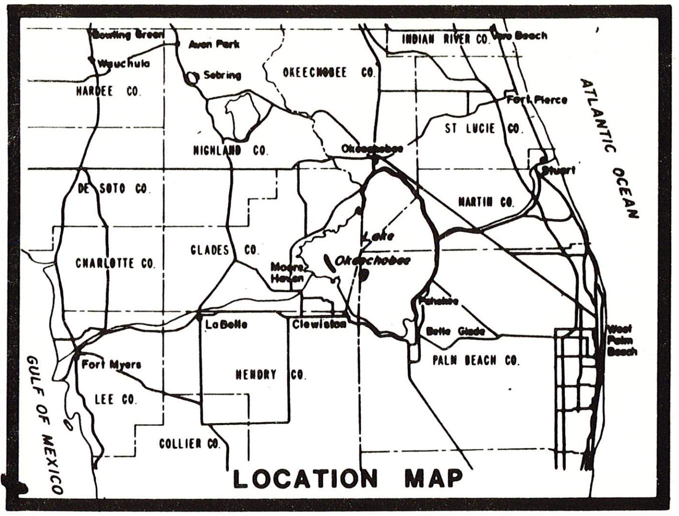
W. P. FRANKLIN RECREATION AREA, NORTH and SOUTH

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District


CLEWISTON PARK
Linear Park
Potential to Enhance Day Use
Paved Roadway
Lacks Shade Trees
No Sanitary Facilities
SHORELINE FISHING PIERS
Safe Pedestrian Access over Revetment.
HURRICANE GATE NO. 2
Point of Interest
NORTH
CORP AREA OFFICE
OPERATIONS BOAT RAMP
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY LINE
TREE ISLAND
MARSH
BOAT RAMP
GABION REVETMENT
FCE 2985
FCE 3811
CONC. PIER
AREA ENGINEER'S OFFICE
CEMETARY
JOLLY ROGER MARINA
INDUSTRIAL CANAL
RAMP LANES
VISTA CLEARING WOULD ENHANCE VIEWS.
MARINA CONCESSION
SMALL PRIVATE CAMPGROUND
HEAVILY-USED BOAT RAMP PARKING TO BE INCREASED. NO SANITARY FACILITIES
LEVEE TRAIL LEAVES LEVEE TO CIRCUMVENT STRUCTURE AND OPERATIONS AREA
CULVERT 2
BLOCK REVETMENT
LEGEND
ACCESS / ENTRY FOR VEHICLES
PAVED ACCESS
TRAIL
VISTAS
DEVELOPED RECREATION AREA
PROJECT OPERATION'S AREA
BARRIER
WELL DEFINED AREA

NOTE: 1. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
OKEECHOBEE CO.
INDIAN RIVER CO.
Vero Beach
Fort Pierce
ST LUCIE CO.
ATLANTIC OCEAN
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
GLADES CO.
CHARLOTTE CO.
Moore Haven
Lake Okeechobee
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
PALM BEACH CO.
HENDRY CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO
LOCATION MAP

LEGEND

EXISTING

SHORELINE
TREE LINE
NEW TREES
PAVED ROADWAY
GRADED ROADWAY
WASHHOUSE
RESTROOM
PICNIC SHELTER
BUILDING
CAMPSITE
PICNIC SITE
PICNIC TABLE W/ SHELTER
TRAIL
PLAY AREA
PIER
OVERLOOK
ENTRANCE STATION
SANITARY DUMP STATION

SCALE IN FEET
200 0 200 400 600

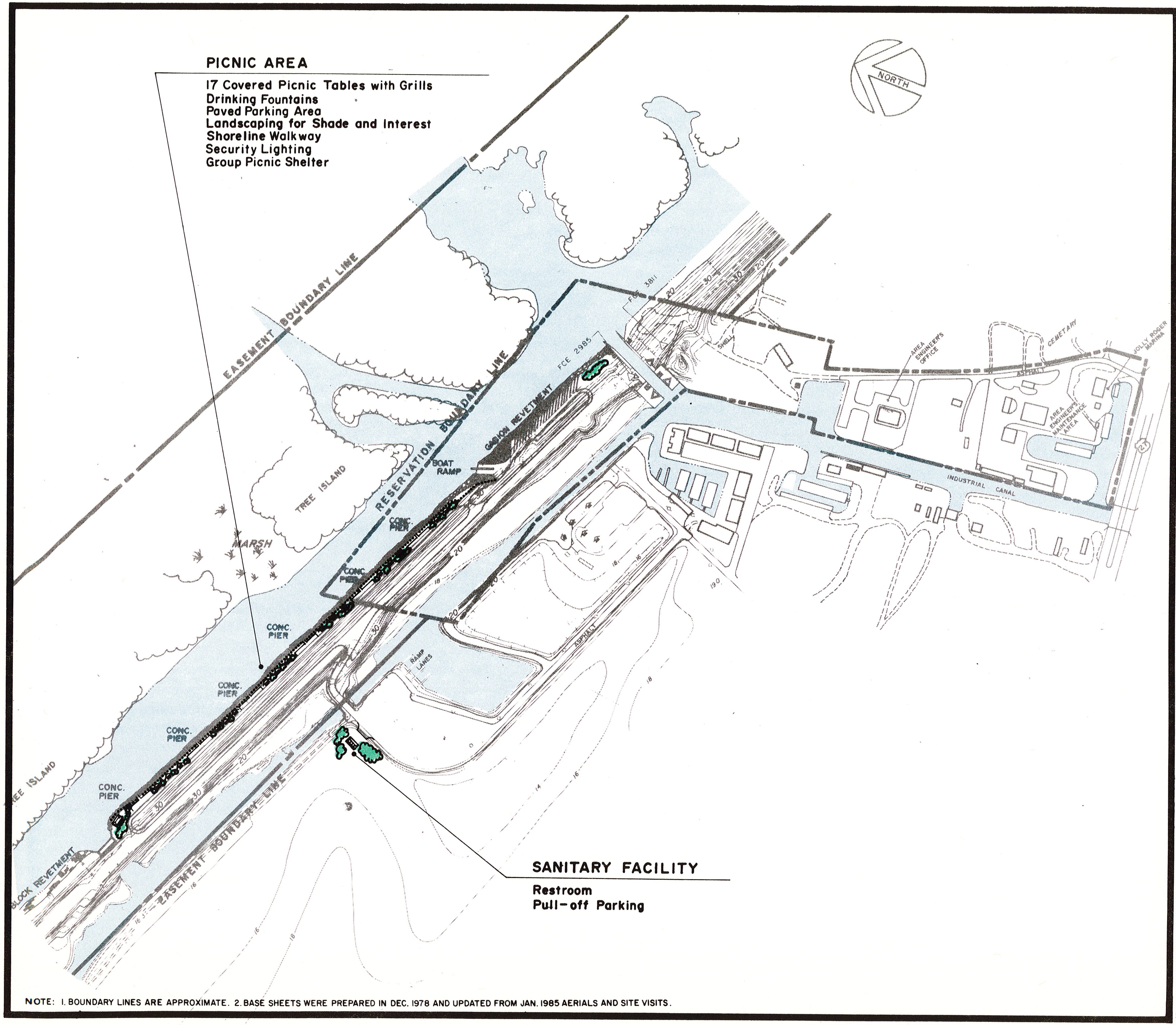
Site Analysis

CLEWISTON RECREATION AREA

Master Plan for Public Use Development and Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

PLATE 11A


NORTH
EASEMENT BOUNDARY LINE
RESERVATION BOUNDARY LINE
TREE ISLAND
MARSH
BOAT RAMP
GABION REVETMENT
FCE 2985
FCE 3811
CONC. PIER
CONC. PIER
CONC. PIER
CONC. PIER
CONC. PIER
CONC. PIER
RAMP LANES
ASPHALT
BLOCK REVETMENT
TREE ISLAND
SHELL
AREA ENGINEER'S OFFICE
CEMETARY
ASPHALT
JOLLY ROGER MARINA
AREA ENGINEER'S MAINTENANCE AREA
INDUSTRIAL CANAL
27
20
30
18
190

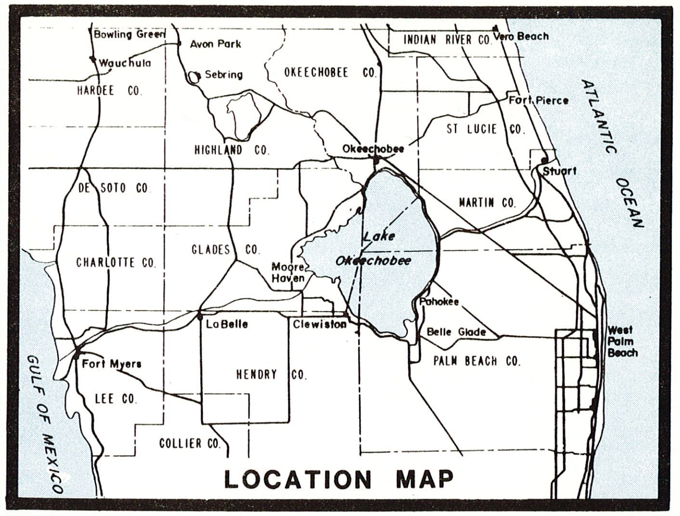
PICNIC AREA

17 Covered Picnic Tables with Grills
Drinking Fountains
Paved Parking Area
Landscaping for Shade and Interest
Shoreline Walkway
Security Lighting
Group Picnic Shelter

SANITARY FACILITY

Restroom
Pull-off Parking

NOTE: I. BOUNDARY LINES ARE APPROXIMATE. 2. BASE SHEETS WERE PREPARED IN DEC. 1978 AND UPDATED FROM JAN. 1985 AERIALS AND SITE VISITS.


Bowling Green
Avon Park
Wauchula
Sebring
HARDEE CO.
INDIAN RIVER CO.
Vero Beach
OKEECHOBEE CO.
Fort Pierce
ST LUCIE CO.
ATLANTIC OCEAN
HIGHLAND CO.
Okeechobee
Stuart
DE SOTO CO.
MARTIN CO.
Lake Okeechobee
CHARLOTTE CO.
GLADES CO.
Moore Haven
Pahokee
LaBelle
Clewiston
Belle Glade
West Palm Beach
Fort Myers
HENDRY CO.
PALM BEACH CO.
LEE CO.
COLLIER CO.
GULF OF MEXICO

LOCATION MAP

LEGEND

	EXISTING	PROPOSED
SHORELINE		
TREE LINE		
NEW TREES		
PAVED ROADWAY	ASPHALT	
GRADED ROADWAY	SHELL	
WASHHOUSE		
RESTROOM		
PICNIC SHELTER		
BUILDING		
CAMPSITE	OR	
PICNIC SITE		AS NOTED
PICNIC TABLE W/ SHELTER		
TRAIL		
PLAY AREA		
PIER		
OVERLOOK		
ENTRANCE STATION		
SANITARY DUMP STATION		

SCALE IN FEET

200 0 200 400 600

Conceptual Development Plan

CLEWISTON RECREATION AREA

Master Plan for Public
Use Development and
Resource Management
Central and Southern Florida

US Army Corps of Engineers
Jacksonville District

RESOURCE MANAGEMENT GUIDELINES

11-1 VISITOR PROGRAMS AND FACILITIES

11-1.1 One of the goals for a Corps of Engineers project is to create greater awareness and understanding of the project's purposes, benefits, natural resources, and its cultural, historical, and archeological features. A lack of awareness or misunderstanding of project purposes could generate conflicts between management and the visiting public. These conflicts could result in an uninformed public and in situations which could be hazardous to users. Lock operations, unstable banks, unmarked channels and unmarked fish habitats are only several situations where a lack of knowledge could present a serious safety problem. Degradation and vandalism of project resources is often the result of disrespect which could be prevented through an increased public awareness of the value of available recreation resources. See addendum

11-1.2 Interpretive services can serve to provide visitors with educational information and even a commitment towards the public responsibility of project maintenance and resource enhancement. Currently, the Central and Southern Florida project provides several interpretive services. The services utilized by the public most often are: tours of lock facilities and the locking process; the annual South Florida Eco-Meet; talks concerning water safety and project purposes; a self-guided nature trail at St. Lucie Lock; and the visitor assistance program.

11-1.3 As a result of increased visitation, the need for meeting with the public becomes more important. In the past, the visitor assistance program focused on vessel protection. Now, that program needs to shift to protection of the resource. More programs need to be organized to inform users about what they can do to protect their resource. Due to the current growth rate, there is an increased need for ranger patrols on project resources. In order to meet this need for informing the public, the Resource Management staff needs to be increased.

11-1.4 Along with the need to increase ranger patrols, displays about the project should be placed in each lock facility's office and the area office. These displays will be self-guided and contain information about the resource, wildlife and the project's current management activities. Displays would inform the visitor about the various project facilities, points of interest and the recreation areas. Cultural, historical and archeological features found within the area of the lock would be featured.

11-1.5 Overlook facilities will be developed at scenic locations around the project. General interpretive data will be located at these locations as well as at selected points along the levee hiking trail, in natural areas and historical sites. Information kiosks and displays will be maintained in all public use areas.

11-1.6 Information brochures will be made available at the various project offices, major scenic locations, trail heads and from uniformed rangers and park attendants. The brochures will explain project safety rules and regulations, project purposes and operation and identify recreation area facilities and activities.

11-1.7 All recreation areas will be provided with waterborne sanitary facilities. Tent/trailer areas will have washhouses containing showers, lavatories, water closets, urinals, and a laundry area. Selected camp units will have individual electrical hookups and water connections. Picnic areas will have restrooms containing lavatories, water closets and urinals. An active program will be developed by the Resource Management to get those public use areas operated by non-federal entities to install sanitary facilities.

11-1.8 Barrier free design of recreation facilities on the project will benefit not only the physically handicapped but also the elderly, the young, the able-bodied who may suffer temporary handicaps, and those performing every day functions involving strollers, carts, etc.

11-2 SIGNAGE

11-2.1 A well planned sign system is a necessary component of the total project circulation system. Signs will be provided to inform, direct and orient park visitors. A sign plan identifying the location and wording of all project related signs will be prepared by the Resource Management. It will be kept current through annual reviews by the Resource Office.

11-2.2 The following signs will be provided to meet applicable Federal, State and Corps regulations:

A. Park Directional Signs are those along State and County roadways which inform potential visitors where a park is located. These signs shall be sited with the approval of the appropriate Department of Transportation office.

B. A Park Entrance Sign will be located at all recreation areas and convey the Park name, Corps of Engineers logo, park use (campground or day use area) and U.S. Fee Area logo (if applicable).

C. Traffic Control Signs shall be standard Department of Transportation types and sizes.

D. Information and Display Boards. These signs will be used in conjunction with project structures, recreation areas and resource management areas. They consist of campsite markers, trail markers, bulletin boards, etc. They shall be of a design compatible with the entrance sign and existing structures.

E. Other considerations.

(1) Recreation symbol signs should be used whenever possible. They are an acceptable way to provide information in an accurate and space-saving way along walks and roadways. They will be white symbols on a brown background.

(2) All signs that present messages pertaining to rules, regulations, project data or other general information shall be consolidated on a display board.

(3) Historical and interpretive signs shall be of a design which is in harmony with the surrounding area.

11-2.3 Small boat navigation aids along the Okeechobee Waterway will include warning, directional, caution and control buoys. Swimming areas will be protected by warning buoys placed beyond roped-in swimming areas. Boat ramps and marinas will provide lighting to guide evening fishermen back to shore Potential shallows created by drawdowns and other hazard areas will be identified as danger areas and buoyed accordingly. Boating courtesy and safety rules will be posted at all launching ramps and marinas to promote safe and enjoyable boating experiences. As a safety measure for boaters, storm warning flags and/or lights may be provided at major launching ramps and marinas to warn boaters of approaching dangerous weather conditions.

11-2.4 Project signs will be installed in accordance with the "Manual on Uniform Traffic Control Devices", U.S. Department of Transportation; "Graphic Standards Manual", EP 310-1-6; and "South Atlantic Division Sign Manual", SADvP 1130-2-1. See addendum

11-3 NAVIGATION

11-3.1 Recreation boaters utilizing the waterway can acquire several publications providing data about the navigation system. Most of these publications could be provided in a single navigation booklet. As boating activities increase, the need for all users to be provided the same information increases. The navigation booklet would supplement the nautical charts prepared by the National Oceanic and Atmospheric Administration and contain the following:

1) Launching ramp locations with depth of water.
2) Types, description and locations of navigation aids.
3) Water depths (approximate).
4) Bridge and powerline locations with elevations of lowest points over the navigation channel.
5) Lock information (depths, size, etc.).
6) Areas where hunting is permitted.
7) Boat trail locations.
8) Mileage along the waterway and around the lake.
9) Location and type of use for all recreation areas.
10) Emergency phone and radio numbers (locks, Coast Guard, campgrounds, concessions, law enforcement and hospitals).

11-3.2 To assist boaters and supplement the booklet, mileage markers should be installed along the Waterway's shoreline. The markers would be good reference points for locating stranded boaters.

11-4 FISH AND WILDLIFE MANAGEMENT

11-4.1 The Project provides an environment which sustains a diversity of fish and wildlife species. It is important that these resources be protected and enhanced so that the public may derive optimum benefits associated with such activities as fishing, hunting, nature study and photography.

11-4.2 A program for fish and wildlife management will be prepared by the Resource Manager in the Operational Management Plan (OMP). The program should address the following objectives which resulted from public input and the master planning process:

(a) To preserve, enhance and maintain a suitable habitat condition necessary for optimum fish and wildlife propagation while maintaining an appropriate ecological balance;

(b) To provide increased recreation opportunities through both consumptive and non-consumptive use of fish and wildlife resources;

(c) To protect native fish and wildlife populations from excessive exploitation, overharvesting and/or environmental degradation;

(d) To manage the fish and wildlife resources to obtain maximum benefits commensurate with the project's primary functions of water supply and navigation;

(e) To coordinate the fish and wildlife enhancement plan with other activities such as forest management, aquatic plant management, recreation area development and interpretive programs;

(f) Recommend procedures necessary to enhance the value of lands for public recreation, wildlife habitat, scenic purposes, protection of endangered species, and the preservation of natural conditions; and

(g) Outline cooperative efforts with other agencies in carrying out management activities such as installing additional artificial reefs, improving habitats, improving water quality and providing manatee safeguards at lock and water control structures.

11-4.3 Lands not outgranted to other agencies for fish and wildlife enhancement activities will be managed by the Corps of Engineers. A number of specific management techniques will be developed to enhance and/or maintain fish and wildlife habitats. Soil type, topography, vegetation, elevation, size of area, water quality conditions, existing fish and wildlife species, access and current land and water use allocations will determine which techniques will be applied to a particular area. Species that need management assistance will be identified.

11-4.4 The Resource Manager and his staff will utilize the techniques established in the OMP to implement the fish and wildlife management program. The OMP will be a long range plan for enhancing fish and wildlife resources and be updated by the Resource Manager as the program needs and objectives change.

11-4.5 The fish and wildlife program will be monitored to identify, both positive and negative effects of various management techniques. Data on fishing and hunting demand, harvest, population structure and productivity will be collected and analyzed. Information obtained from these studies will be utilized by the Corps and cooperating agencies to guide present management programs and to formulate additional ones.

11-5 SAFETY

11-5.1 Specific safety policies will be prepared in the OMP under the Park Management section. The plan will be aimed at providing a safe environment for the visiting public, Corps personnel, contractors and preventing damage to public and private property. The plan will address accident prevention, health and safety standards, equipment, facilities, operations procedures, employee training and water safety.

11-6 AESTHETICS

11-6.1 Resource management will assist in accomplishing the following three objectives to maintain and enhance aesthetic resources at the Project. The first objective is to undertake an evaluation of aesthetic resources and establish overall aesthetic quality objectives for the Project. The entire Project should be mapped according to established Corps aesthetic resources criteria. The second objective is to identify on a case by case basis the potential impact of any proposed activity on the project's aesthetic resources. The third objective is to assist in developing and implementing guidelines for any proposed activity to maintain aesthetic quality. Interim aesthetic quality objectives prior to the inventory and evaluation process will include but not be limited to 1) maintaining scenic views and vistas; 2) establishing a variety of native vegetation in public use areas; 3) preserving native shoreline vegetation; 4) enhancing the presence of desirable wildlife; 5) coordinating design concepts for buildings, signs, playground equipment, fences, guardrails, etc in public use areas; 6) removing encroachments; and, 7) ensuring proper site maintenance at outgranted areas.

11-7 LAW ENFORCEMENT

11-7.1 All State laws will apply on project lands, and State and local law enforcement agencies will have jurisdiction and enforcement responsibilities under concurrent jurisdictions. This will result in several law enforcement agencies patrolling the project land and waters. Specific law enforcement policies for the Central and Southern Florida Project should be formulated by each enforcement agency and included in the OMP.

A. The Resource Management staff, with citation authority, enforces federal regulations on project lands and waters. This includes violation citation under the Federal Magistrate System, Title 36 CFR.

B. The Florida Highway Patrol has the power and responsibility to enforce State law on all project lands.

C. Martin, Palm Beach, Hendry, Glades, Okeechobee and Lee County Sheriff Departments have law enforcement power and responsibility on project lands in their respective county jurisdictions.

D. The Department of Natural Resources will have law enforcement power and responsibility on project lands under its management and on all project waters.

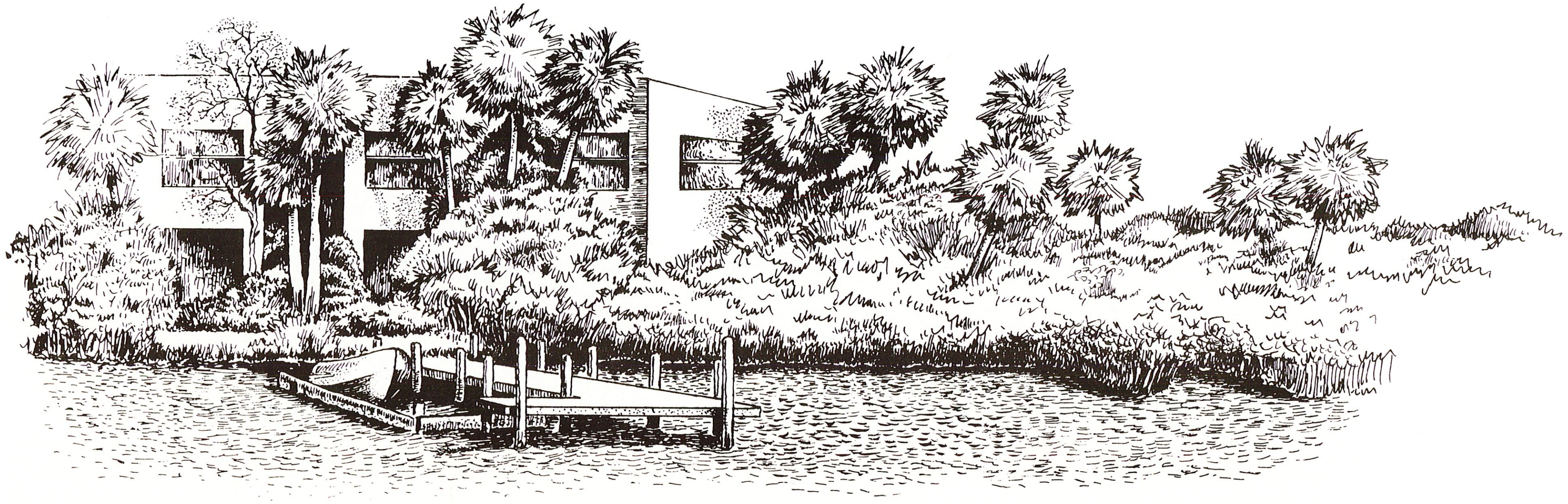
E. Hunting will not be allowed on Corps of Engineers fee land.

11-8 LANDSCAPING

11-8.1 Landscaping serves many purposes including developing ground cover for soil stabilization; providing buffers and screening for sound and visual privacy; and environmental enhancement. Because of their longevity and ease of maintenance, trees should dominate the park landscape.

11-8.2 If planted in carefully defined areas, shrubbery offers certain qualities. Massed shrubbery can prevent or discourage movement at ground level; provide an effective screen for traffic, parking and maintenance areas; and create points of interest on the landscape.

11-8.3 When possible, indigenous plant species should be used in the landscaping on the Project. The following table is a partial list of plants that are tolerant of the South Florida climate and will blend naturally with the environment.



Shoreline vegetation retained to enhance aesthetics

Table 11A

COMMON NAME	BOTANICAL NAME
Large trees	
Red Maple	*Acer rubrum
Black Olive	*Bucida buceras
Golden Rain tree	Koelreuteria formosana
Sweet Gum	*Liquidambar styraciflua
*Sweet Bay	*Magnolia virginiana
Mastic tree	*Mastichodendron foetidissimum 'Cronquist'
Slash Pine	*Pinus elliottii 'Densa'
Laurel Oak	*Quercus laurfolia
*Water Oak	*Quercus nigra
Live Oak	*Quercus virginiana
Red Mangrove	*Rhizophora mangle
Mahogany	*Swietenia mahagoni
Bald Cypress	*Taxodium distichum
Basswood	Tilia caroliniana
Palms	
Saw Cabbage Palm	*Acoelorrhaphe wrightii
Florida Silver Palm	*Coccothrinax argentata
Florida Royal Palm	*Roystonea elata
Cabbage Palm	*Sabal palmetto
Saw Palmetto	*Serenoa repens
Florida Thatch Palm	*Thrinax radiata
Small trees	
Sea Grape	*Coccoloba uvifera
Dahoon Holly	*Ilex cassine
Southern Red Cedar	*Juniperus silicicola
Queen's Grape Myrtle	Lagerstroemia speciosa
Wax Myrtle	*Myrica cerifera
Cherry Laurel	*Prunus caroliniana
Shrubs	
Bottle-Brush	Callistemon spp.
Cocoplum	*Chrysobalanus icaco
Scarlet-Brush	Hamelia patens
Gallberry	*Ilex glabra
Scrub Holly	*Ilex opaca arenicola
Dwarf Yaupon	Ilex vomitoria 'Nana'
Chinese Juniper	Juniperus chinensis spp.
Shore Juniper	Juniperus conferta
Oleander	Nerium oleander
Devilwood	Osmanthus americanus
Pittosporum	Pittosporum tobira
Spineless Yucca	Yucca elephantipes
Bear-Grass Yucca	Yucca smalliana
Coontie	*Zamia floridana
Ground Cover/Vines	
Trumpet Creeper	Campsis radicans
Penny Grass	Dichondra carolinensis
Golden Creeper	*Ernodea littoralis
Carolina Yellow Jasmine	Gelsemium sempervirens
Grasses	
Common Bermudagrass	Cynodon dactylon
Argentine Bahiagrass	Paspalum notatum
Chinese Lespedeza	Sericea lespedeza
Saltmeadow Cordgrass	*Spartina patens

*Native to Florida see addendum
* " " "

11-9 OUTGRANTS

11-9.1 The Corps of Engineers will make determinations of availability of project lands, waters and facilities for all outgrants. A concession lease shall not be granted until an adequate market study and analysis has been completed. This is to insure that facilities will provide optimum services to the public. Site selection for concession development and operation will be carefully considered to insure adequate and safe access, proper distribution and location of facilities, and to lessen the possible adverse effect of concession users on nearby public use facilities and businesses.

11-9.2 Leases shall be prepared for a short term with an "option to renew " clause. The lease may be renewed if the lessee has complied with all State requirements as well as Corps criterion for appearance, maintenance and service to the public. See section "Concession Activities" for additional criteria.

11-9.3 Permits and licenses may be issued if the applicant's request is in accordance with the Land Management Classification Plan, a part of this Master Plan, and the Lakeshore Management Plan, a part of the OMP. Each request will be reviewed on its own merit with due consideration given to its effects on the environment. Private facilities will not be sited adjacent to recreation, commercial, protected and scenic areas.

11-9.4 Most of the Project's existing encroachments are due to unmarked easement boundary lines. As a result, the boundary along the St. Lucie Canal was marked during 1985. Plans are underway to do the same along the Caloosahatchee River. Encroachments will be handled on a case by case basis. Special emphasis, such as installing boundary signs, increased Ranger patrols, informing and educating the public through printed materials and presentations at meetings, are planned to reduce and prevent future encroachments on project lands.

11-10 CONCESSION ACTIVITIES

11-10.1 Requirements for the design, initial investment, planned expansion and operation and maintenance of concession facilities should be established and included as part of the lease agreement. The facilities should be operated by a State, County or City agency or be leased to a private operator. Concession leasing is intended to provide needed facilities that will be profitable for the operator, a service to project visitors, and compatible with the environment. Rentals, sanitary facilities and sundries should be provided as part of the concession activity.

11-10.2 Lease proposals will be reviewed to insure that the siting of facilities is consistent with the development of the approved Master Plan and compatible with the environment; proposed concession is economically feasible; method of operation and quality of service will enhance visitor enjoyment and convenience; and proposed structures and buildings will be designed and constructed to compliment and enhance the Project and be compatible with other buildings in the area.

11-11 WATER RESOURCES

11-11.1 When considering water resources, one of the primary concerns is water quality. Fish and wildlife and recreation depends on the quality and quantity of water supplies. Water quality is affected by the amount of runoff from agricultural and urban sections of the watershed. If the present quality of water in the Caloosahatchee River is to be maintained, measures need to be taken and enforced to control future development and runoff. Proper management will require continued coordination with local enforcement agencies with increased frequency.

11-11.2 Lake Okeechobee is almost completely regulated by the control of inflows and outflows. The Lake is surrounded by a 25-foot dike designed to control flooding and to increase water storage capacity for water supply to the agricultural areas, the Everglades National Park and the lower east coast. Although the lake could be rated "eutrophic", based on nitrogen and phosphorus content of the water, it exhibits few of the physical symptons commonly associated with eutrophy. It supports vigorous sport and commercial fisheries and has no nutrient base aquatic plant problems nor oxygen deficits. These facts have been attributed to unidentified factors limiting nuisance plant growth and to wind-induced aeration. Prevention of problems stemming from water quality is intensively addressed by State programs. These programs range from Best Management Practices and curtailment of backpumping by agricultural interests and control of discharge by municipalities to stream and wetland restoration to improve natural inflow quality.

11-11.3 Water quality in the St. Lucie Canal apparently changed very little since it was constructed; however, the St. Lucie Estuary has been affected by the Canal. The estuary is receiving large volumes of turbid freshwater and sediments which seem to be affecting the fish and fisheries. Additional efforts for reducing the amount of freshwater into the estuary need to be studied and the results of the study incorporated into the operation regulations of the lock. In addition, proper management and enforcement is required to control future development and runoff.

11-12 CULTURAL RESOURCES

11-12.1 The Project has played an integral role in the region's development. The Corps of Engineers has been instrumental throughout the Project's early phases of flood control and navigation to the current operations of the vast water resources system. Historic structures which are part of project works and the entire story of project operations provide material for interpretive exhibits. Exhibits may be installed in Corps offices (Type C Visitor Centers) and public use areas. Significant cultural resources may be designated with signs and interpretive material provided where available. Exhibits and pamphlets should be designed for various age groups.

11-13 RECREATION AREA MAINTENANCE

11-13.1 Service contracts are utilized to maintain Corps recreation areas and project lands in a clean and safe condition. Contractors perform grass mowing and trimming on the levees and on fee lands, clean site facilities, remove trash and repair roadways.

11-13.2 The maintenance staff maintains the locks and perform minor facility repairs, ie. equipment, signs, tables, and grill repairs. During emergency periods, the locks and gates are staffed for 24 hour periods. The Resource Management staff maintains the park bulletin boards and minor visitor assistance items.

11-14 FIRE PROTECTION

11-14.1 A fire protection plan will be prepared in the OMP. Provisions will be included for grass and forest fire prevention and presuppression and suppression functions. The plan will include fire fighting training techniques, procedures in case of fire, and the recommended equipment and tools for prompt suppression activities.

11-15 EROSION

11-15.1 Shoreline erosion impacts the operation and use of a project in several ways; such as access to the shoreline, aesthetics, water quality, siltation, loss of public land and private property. An extensive erosion control program is underway for protecting approximately two-thirds of Lake Okeechobee's shoreline. A study is being prepared to determine how much of the banks on the St. Lucie Canal need to be protected and what methods to use.

11-15.2 Permit applications from adjacent landowners for shoreline erosion control will be reviewed. The request must avoid conflict with natural or fish and wildlife areas and consider the safety of project users. The use of vegetation that tolerates periodic flooding will be encouraged.

11-15.3 Disturbed lands under Corps management will be stabilized and revegetated. Diversion ditches and other methods will be utilized where needed to protect park facilities, roads, trails, etc. see addendum

CENTRAL & SOUTHERN FLORIDA PROJECT

NOVEMBER 1989

Addendum to Chapter 11,
Resource Management Guidelines

Introduction

The following section was added to the Master Plan to be used as guidance in the development of the plans and specifications for construction of operational facilities on Lake Okeechobee and the Okeechobee Waterway.

11-17 OPERATIONAL FACILITIES

11-17.1 Operational maintenance sites are necessary for the safe and efficient operation of the project's authorized purposes. Operational boat ramps are required on this project for equipment mobility, aquatic plant spraying, and emergency rescue operations, to name a few. Public use of these boat ramps as recreational facilities is widespread.

11-17.2 The gray shaded areas in Figure 11A represent existing unimproved boat ramps that have been designated for improvement as operational maintenance sites. To insure the safety and welfare of the public and to provide sufficient parking for future project and public needs, improvements will include additional parking spaces and paved boat ramps, where applicable. The following sites are designated as operational areas:

Harney Pond
Rardin Park
Canal Point
Taylor Creek
Nubbin Slough
Labelle Access
Sportsman Village

John Stretch Park
North Hicpochee Access
South Hicpochee Access
Clewiston Recreation Area
Port Mayaca Recreation Area
Indian Prairie Recreation Area

11-17.3 Specifically, the justifications for these ramps are as follows:

A. Emergency situations require quick access; trailering boats to a convenient ramp is much quicker than travelling by water.

B. Adverse weather conditions can make long distance water travel to and from emergency and/or routine inspection sites impossible.

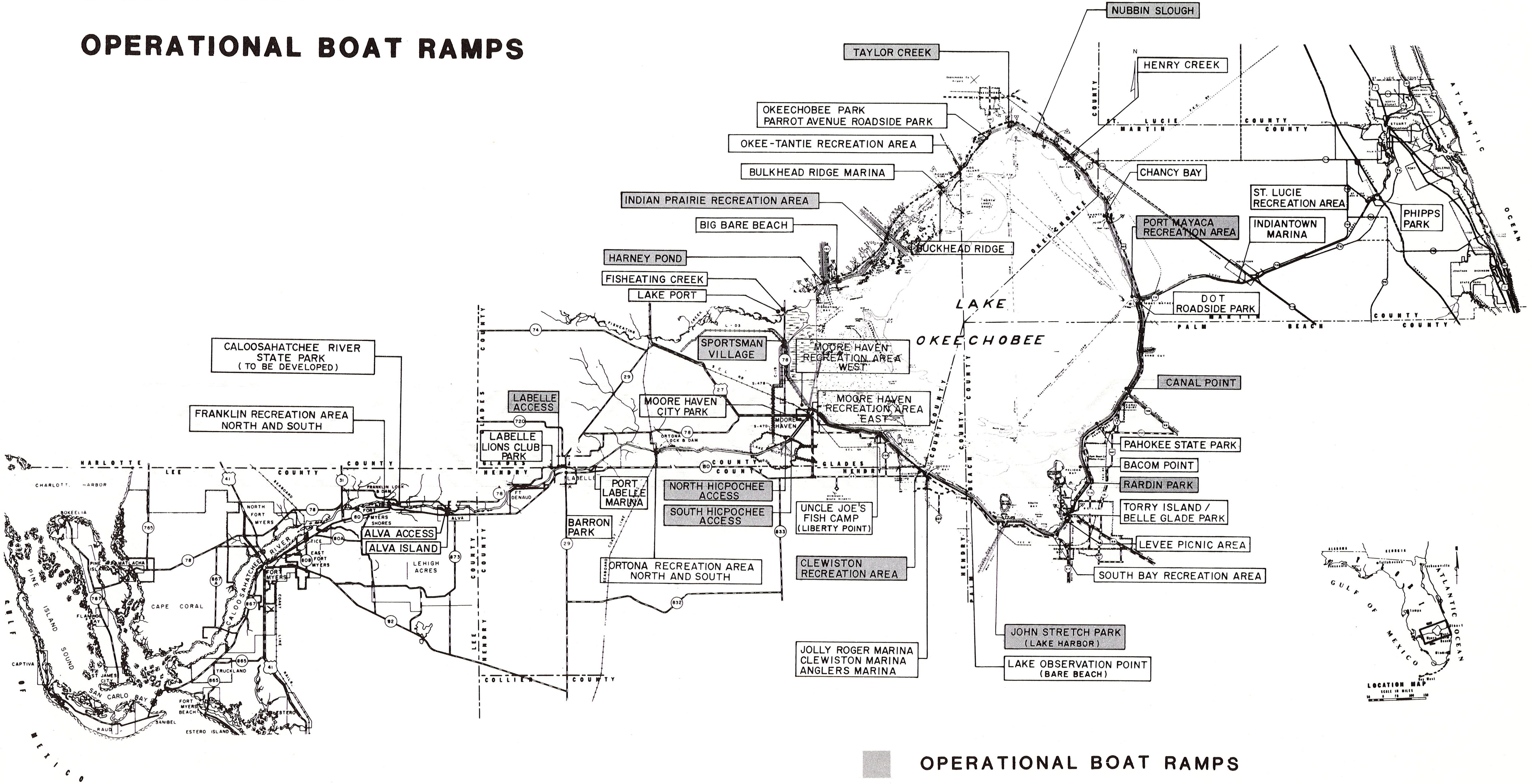
C. Low water conditions can also preclude long distance water travel and/or access in many locations; therefore, numerous key access points must be provided.

D. Emergency situations occurring at night after lock operations have ceased (10 p.m.) require that boat ramps located between the locks be maintained and available for use by project personnel.

11-17.4 Canal Point will be the first maintenance site to be developed in the fiscal year 1990. The close proximity of the site to a hurricane gate necessitates storage for large equipment and vehicles. Adding parking space to the existing lot will allow for both recreational and operational activities.

C &SF PROJECT:

OPERATIONAL BOAT RAMPS


NUBBIN SLOUGH
TAYLOR CREEK
HENRY CREEK
OKEECHOBEE PARK
PARROT AVENUE ROADSIDE PARK
OKEE-TANTIE RECREATION AREA
BULKHEAD RIDGE MARINA
CHANCY BAY
INDIAN PRAIRIE RECREATION AREA
ST. LUCIE RECREATION AREA
PHIPPS PARK
BIG BARE BEACH
PORT MAYACA RECREATION AREA
INDIANTOWN MARINA
BUCKHEAD RIDGE
HARNEY POND
FISHEATING CREEK
LAKE PORT
DOT ROADSIDE PARK
LAKE
OKEECHOBEE
CALOOSAHATCHEE RIVER STATE PARK (TO BE DEVELOPED)
SPORTSMAN VILLAGE
MOORE HAVEN RECREATION AREA WEST
CANAL POINT
LABELLE ACCESS
MOORE HAVEN CITY PARK
MOORE HAVEN RECREATION AREA EAST
FRANKLIN RECREATION AREA NORTH AND SOUTH
LABELLE LIONS CLUB PARK
PAHOKEE STATE PARK
BACOM POINT
RARDIN PARK
PORT LABELLE MARINA
NORTH HICPOCHEE ACCESS
SOUTH HICPOCHEE ACCESS
UNCLE JOE'S FISH CAMP (LIBERTY POINT)
TORRY ISLAND / BELLE GLADE PARK
ALVA ACCESS
ALVA ISLAND
BARRON PARK
LEVEE PICNIC AREA
ORTONA RECREATION AREA NORTH AND SOUTH
CLEWISTON RECREATION AREA
SOUTH BAY RECREATION AREA
JOHN STRETCH PARK (LAKE HARBOR)
JOLLY ROGER MARINA
CLEWISTON MARINA
ANGLERS MARINA
LAKE OBSERVATION POINT (BARE BEACH)
CHARLOTTE COUNTY
LEE COUNTY
GLADES COUNTY
HENDRY COUNTY
COLLIER COUNTY
PALM BEACH COUNTY
MARTIN COUNTY
ST. LUCIE COUNTY
OKEECHOBEE COUNTY
CHARLOTTE HARBOR
PINE ISLAND SOUND
CAPE CORAL
FORT MYERS
NORTH FORT MYERS
FORT MYERS SHORES
EAST FORT MYERS
LEHIGH ACRES
CALOOSAHATCHEE RIVER
SAN CARLO BAY
FORT MYERS BEACH
SANIBEL
CAPTIVA
ESTERO ISLAND
GULF OF MEXICO
ATLANTIC OCEAN
LABELLE
MOORE HAVEN
ALVA
FT DENAUD
ORTONA LOCK & DAM
FRANKLIN LOCK & DAM
STUART
GULF OF MEXICO
ATLANTIC OCEAN
LOCATION MAP

▨ OPERATIONAL BOAT RAMPS

PART V

PLAN IMPLEMENTATION

LEWISTON AREA OFFICE AND PARK

CHAPTER 12

SUMMARY AND RECOMMENDATIONS

SUMMARY AND RECOMMENDATIONS

12-1 SUMMARY

12-1.1 From focus on resource management and development to support continued recreation use two areas of recommendations have been developed. The first area pertains to guidelines for resource use contained in the Land Management Classification Plans, the Resource Use Objectives and the Resource Management Guidelines. Implementation requires continuing consideration and coordination in all Corps activities and will result in the long-term maintenance of a sound environment.

12-1.2 The second area of recommendations are the proposed Conceptual Development Plans. Increasing demand for improved and new recreation areas on the project is well documented. Since the 1968 authorization of the C&SF Project and the recognition of recreation as a full project purpose, some progress has been achieved in realizing the project's recreation potential. However, there is still an imbalance between facilities for water access and multi-use facilities for general recreation activities. Proposals include the rehabilitation and construction of multi-use areas and the rehabilitation of a number of access sites. Implementation will assure continued and increasing visitor appeal and benefits from the project.

12-2 RECOMMENDATIONS

12-2.1 It is recommended that this Master Plan be approved as a guide for the future development and management of all project lands and waters. Since new development and resource enhancement relies on the participation of a non-Federal sponsor in accordance with the Federal Water Project Recreation Act of 1965, State and other local governments should be encouraged to assume a greater responsibility for recreation development, fish and wildlife and other natural resource management.

PUBLIC REVIEW COMMENTS AND RESPONSES

APPENDIX A

SECTION 1

PUBLIC REVIEW COMMENTS

FRANK A. WACHA
District 1

TOM HIGGINS
District 2

Chairman
THOMAS G. KENNY, III
District 3

MAGGY HURCHALLA
District 4

Vice Chairman
JOHN W. HOLT, JR.
District 5

BOARD OF COUNTY COMMISSIONERS
50 Kindred Street • Stuart, Florida 33497

ROBERT H. OLDLAND • County Administrator

PHONE (305) 283-6760

COUNTY OF MARTIN STATE OF FLORIDA

February 25, 1987
CA-87-97L

Department of Army
Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonville, Fl. 32232-0019

ATT: A. J. Salem, Chief
Planning Division

Dear Mr. Salem:

Martin County is in receipt of your letter dated January 28, 1987 and draft Phase I Master Plan for the Central and Southern Florida Project. These materials have been circulated to the Board of County Commissioners and staff for review and comment.

Please be advised that Martin County would like a copy of the final Master Plan when complete.

Sincerely,

Robert H. Oldland
County Administrator

RHO/dv

State of Florida
DEPARTMENT OF NATURAL RESOURCES

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

DR. ELTON J. GISSENDANNER
Executive Director

BOB MARTINEZ
Governor
GEORGE FIRESTONE
Secretary of State
BOB BUTTERWORTH
Attorney General
GERALD LEWIS
State Comptroller
BILL GUNTER
State Treasurer
DOYLE CONNER
Commissioner of Agriculture
BETTY CASTOR
Commissioner of Education

PLEASE ADDRESS REPLY TO:

March 11, 1987

Mr. A. J. Salem, Chief
Planning Division
Corps of Engineers
Post Office Box 4970
Jacksonville, FL 32232-0019

Dear Mr. Salem:

The Division of Recreation and Parks has reviewed the ACOE Lake Okeechobee and Okeechobee Waterway master plan and has compared it to our plans for this area.

The ACOE plan for the easement area within Caloosahatchee River State Recreation Area is generally consistent with our preliminary conceptual plans for this recreation area. We feel however, that the residence and maintenance area would be better located in a well-screened area north of the main boat ramp.

Thank you for allowing us to participate in this review.

Sincerely,

Ney C. Landrum
Director
Division of Recreation and Parks

NCL/bhb

"It shall be the policy of the state to conserve and protect its natural resources and scenic beauty..."
—Florida Constitution, Article II, Section 7.

South Florida
Water Management District

John R. Wodraska, Executive Director
Tilford C. Creel, Deputy Executive Director

Post Office Box 24680 3301 Gun Club Road
West Palm Beach, Florida 33416-4680
Telephone (305) 686-8800
Florida WATS Line 1-800-432-2045

IN REPLY REFER TO:

March 5, 1987

District Engineer
Department of the Army
U.S. Army Engineer District
Jacksonville
Post Office Box 4970
Jacksonville, FL 32232-0019

Attention: SAJPD-ER

Dear Sir or Madam:

Subject: Draft
Lake Okeechobee/Okeechobee Waterway Master Plan
Phase 1

We have completed our review of the subject master plan and offer the following comments and recommendations:

1. Chapter 2-9.10, Page 2-9. It is our understanding that the Pahokee State Recreation Area has been transferred to the City of Pahokee. Also, consideration is being given to a transfer of the Everglades Reclamation State Historic Site to Palm Beach County. This site was developed by the District and is being operated by DNR under an agreement with the District.

2. Table 5E, Page 5-3. Suggest checking the last two columns in the table. It appears that the parentheses denoting the Corps' standard has been omitted from two of the figures.

3. Chapter 6-5.1, Page 6-3. Recommend insertion of the word proposed in referencing the Florida National Scenic Trail. As yet, no segment of the trail has been officially certified as national scenic trail. Initial certification will probably involve existing segments of the Florida Trail on federally owned lands.

4. Chapter 6-7.1, Page 6-4. In developing the recommendation for additional swimming beaches, was consideration given to the suitability of project waters for this activity? Water quality problems may be a factor in the general lack of suitable freshwater swimming sites in this part of the state.

5. Chapter 10-10.2A, Page 10-6 and Chapter 11-1.7, Page 11-1. Vandalism is a serious problem at many recreation sites. The need for an on-site caretaker should be evaluated prior to the installation of sanitary facilities, particularly at remote locations or those not subject to frequent patrol.

William E. Sadowski, Chairman - Miami
John F. Flanigan, Vice Chairman - North Palm Beach
Stanley W. Hole, Naples
J. Neil Gallagher, St. Cloud
Nathaniel P. Reed, Hobe Sound
Kathleen Shea Abrams, Miami Shores
Timer E. Powers, Indiantown
Nancy H. Roen, Plantation
Oscar M. Corbin, Jr., Ft. Myers

Department of the Army
March 5, 1987
Page 2

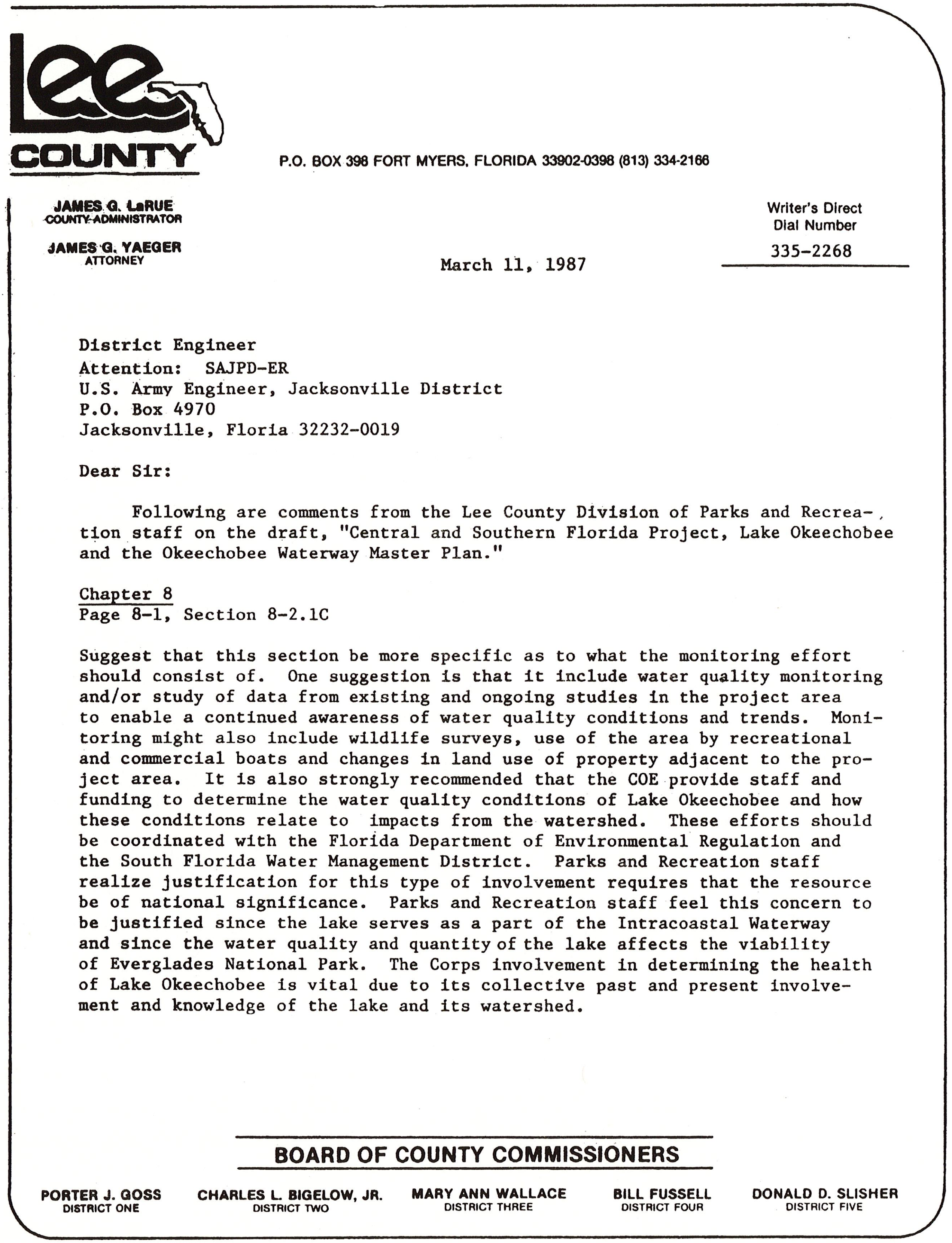
6. Table 11A, Page 11-3. Water Oak, Sweet Bay, and Gallberry are considered native to Florida.

Your staff is to be commended for an outstanding effort in assembling the considerable information contained in the plan. The recommendations are for the most part right on the mark and if implemented, will provide the coordinated effort needed to properly manage the natural resources of the project and meet the existing and future demand for quality outdoor recreation facilities and services.

Sincerely,

Tilford C. Creel
Deputy Executive Director

TCC/fsb



lee COUNTY
P.O. BOX 398 FORT MYERS, FLORIDA 33902-0398 (813) 334-2166

JAMES G. LaRUE
COUNTY ADMINISTRATOR

JAMES G. YAEGER
ATTORNEY

Writer's Direct
Dial Number
335-2268

March 11, 1987

District Engineer
Attention: SAJPD-ER
U.S. Army Engineer, Jacksonville District
P.O. Box 4970
Jacksonville, Floria 32232-0019

Dear Sir:

Following are comments from the Lee County Division of Parks and Recreation staff on the draft, "Central and Southern Florida Project, Lake Okeechobee and the Okeechobee Waterway Master Plan."

Chapter 8
Page 8-1, Section 8-2.1C

Suggest that this section be more specific as to what the monitoring effort should consist of. One suggestion is that it include water quality monitoring and/or study of data from existing and ongoing studies in the project area to enable a continued awareness of water quality conditions and trends. Monitoring might also include wildlife surveys, use of the area by recreational and commercial boats and changes in land use of property adjacent to the project area. It is also strongly recommended that the COE provide staff and funding to determine the water quality conditions of Lake Okeechobee and how these conditions relate to impacts from the watershed. These efforts should be coordinated with the Florida Department of Environmental Regulation and the South Florida Water Management District. Parks and Recreation staff realize justification for this type of involvement requires that the resource be of national significance. Parks and Recreation staff feel this concern to be justified since the lake serves as a part of the Intracoastal Waterway and since the water quality and quantity of the lake affects the viability of Everglades National Park. The Corps involvement in determining the health of Lake Okeechobee is vital due to its collective past and present involvement and knowledge of the lake and its watershed.

BOARD OF COUNTY COMMISSIONERS

PORTER J. GOSS DISTRICT ONE
CHARLES L. BIGELOW, JR. DISTRICT TWO
MARY ANN WALLACE DISTRICT THREE
BILL FUSSELL DISTRICT FOUR
DONALD D. SLISHER DISTRICT FIVE

Page 8-1, Section 8-2.1

A new E is suggested as follows:

Consider environmental quality in the design or renovating of facilities. Discussion: Use of up-to-date information and state of the art techniques should be the first step in determination of proper design considerations of projects. Boat ramps should have catchment basins that direct oily bilge water into subsurface drain fields instead of into the river or lake. Careful evaluation of chemically treated timbers and other materials should be made to allow selection of materials that are the least harmful to the environmental quality of the river and lake.

Page 8-1, 8-2.B

It is suggested that the statement "Replace exotic species with native species..." include: requiring minimal supplemental watering and fertilizer.

Page 8-2 Chapter 8

Suggest include a section on education (manatee, lock operation, boating and water skiing safety, role of Lake Okeechobee as "liquid heart of South Florida" etc.)

Chapter 9
Plate 50 of 52

It is recommended that additional sites in Lee County be included for possible purchase and development. Potential sites include Alva Island and the area at the mouth of Spanish Creek.

As a general comment it is suggested that the sites shown for recreation and fish and wildlife for the Caloosahatchee River be developed to include campsites to allow use by the boating public. It is also suggested that the Corps consider developing the Okeechobee Waterway as a canoe trail.

Chapter 10
Plates 10A & 10 and Plate 52 in CH. 9

It is recommended that better pedestrian access be provided across the locks to allow the public to view the operation of the locks, to gain a better vantage point to look up and down the river, and to allow access to the beach and other facilities on the south side at Franklin Locks by visits to the north side.

Chapter 11
Page 11-3, Section 11-8 Table 11A

An asterisk should be added to water oak, sweet bay, gallberry and saltmeadow cordgrass as these species are native to Florida.

The native species listed including mastic tree, mahogany, Florida silver palm, Florida royal palm, Florida thatch palm, sea grape and red mangrove are tropical in origin and are cold sensitive to varying degrees. These species are not recommended for use in the project area due to the likelihood of freeze kill or damage.

2

Lee County, Board of County Commissioners,
Letter dated March 11, 1987 (continued).

The exotic species listed should be removed from the list for consistency with sections 8-2.1D and 8-2.2B.

In conclusion we note that a tentative plan is included for the State Recreation Area on the Caloosahatchee west of Alva. It should be noted that development by the park plan shall be coordinated between the Corps, State DNR, and Lee County.

Parks and Recreation staff appreciate the opportunity to comment on this plan and hope these suggestions are helpful. We should appreciate receiving a copy of the final version of the plan.

Sincerely,

Maley Brancaccio

Maley Brancaccio
Director
Lee County Division of Parks and Recreation

MB:RC/pm

cc: David Milligan
Roger Clark

FLORIDA GAME AND FRESH WATER FISH COMMISSION

WILLIAM G. BOSTICK, JR. Chairman, Winter Haven
MRS. GILBERT W. HUMPHREY Vice-Chairman, Miccosukee
THOMAS L. HIRES, SR. Lake Wales
C. TOM RAINEY, D.V.M. Miami
J.H. BAROCO Pensacola

ROBERT M. BRANTLY, Executive Director
ALLAN L. EGBERT, Ph.D., Assistant Executive Director

P. O. Box 1840
Vero Beach, Florida 32961

March 23, 1987

Mr. A. J. Salem
Chief, Planning Division
Department of the Army
Jacksonville District, Corps of Engineers
P.O.Box 4970
Jacksonville, Florida 32232-0019

Re: Draft Lake Okeechobee
Okeechobee Waterway Master Plan

Dear Mr. Salem:

The Office of Environmental Services of the Florida Game and Fresh Water Fish Commission (GFC) has reviewed the Draft Lake Okeechobee Waterway Master Plan received from the United States Army Corps of Engineers, dated, February 5, 1987. Our comments are submitted in compliance with the Fish and Wildlife Coordination Act.

The Okeechobee Waterway is a component of the flood protection plan for south Florida. Flood protection and freshwater retention have been the primary elements of all water related plans associated with Lake Okeechobee, with a relatively low priority assigned to fish and wildlife resources. Thousands of acres of south Florida native habitat have been impacted by the construction of hundreds of miles of canals, levees, and water control structures. Historical drainage patterns have been disrupted, altered, and manipulated. These changes have reduced Lake Okeechobee's historical lake levels, which exceeded 20 feet mean sea level (msl), to the current regulated schedule between 15.5 and 17.5 feet msl. Additionally, these changes have contributed to a reduction of lake size and water quality, water delivery problems through the Water Conservation Areas to the Everglades National Park, elimination of lakes and rapids associated with the "improvements" to the Caloosahatchee River, freshwater pollution and siltation into the St. Lucie Canal estuary, and thousands of acres of secondary impacts resulting from the development of agriculture in south Florida. Available evidence suggests that the 1978 Lake Okeechobee lake level regulation change has continued to

March 23, 1987
Page 2

negatively impact wildlife habitat. This evidence suggests the lake level change stimulated the spread of torpedo grass and cattail and has largely eliminated the spikerush communities. The domination of the mixed grass zone (≥13.0 ft msl) by torpedo grass and enlarged stands of monotypic cattail communities has resulted in severe reductions of annuals, many of which are highly preferred food items of migratory waterfowl and other wildlife.

Five species of wildlife within the study area have been classified by the GFC as endangered: the Florida panther, snail kite, wood stork, Florida grasshopper sparrow, and West Indian manatee. Twenty other species are listed as threatened or of special concern within the project's study area. These listed species are also dependent on habitats which have been altered by the construction and maintenance of the waterway or by the secondary impacts of the waterway's development.

To help offset the losses associated with past water management practices in south Florida, the GFC recommends that the Okeechobee Waterway Master Plan be broadened in scope to include restoration/mitigation of fish and wildlife resources. A potential area of mitigation is increased water flow through old oxbows of the Caloosahatchee River as identified in the Environmental Assessment Related to the Construction, Use and Maintenance of the Okeechobee Waterway, Florida Technical Report Contract #DACW17-80-C-0048. Other areas of mitigation could be developed to increase plant diversity or improve the existing habitats associated with the waterway such as planned management drawdowns within the lake, Caloosahatchee River, and St. Lucie River; cattle grazing within Lake Okeechobee marshes to remove trapped nutrients, increasing plant diversity and productivity, and eliminating duff; controlled burning of the lake's marshes which would provide the same benefits as cattle grazing; and Lake Hicpochee could be managed to benefit wading birds and migratory waterfowl.

Our review found the proposed Master Plan has adequately outlined user related problems dealing with access and vandalism. On page 2-5, under Project Management, a Lakeshore Management Plan was stated as being prepared to provide a comprehensive, planned approach to insure protection of desirable environmental characteristics, visitor safety, restoration of shoreline where degradation has occurred, and other problems occurring with various uses of the shoreline and project waters. The GFC would like to coordinate with the Corps in the development of this plan.

The Planning Analysis section relies heavily on the the 1981 State Comprehensive Outdoor Recreation Plan (SCORP) created by the Florida Department of Natural Resources. We are concerned that the age of the study, small sample size, short duration, and time of year the sample was taken has biased the findings such that the existing boat ramp and parking needs are underestimated. These shortcomings also affect the per capita participation rates for all activities reviewed by this report. Therefore, we recommend that a more thorough survey be completed before projected needs of 2030 are addressed.

March 23, 1987
Page 3

Our previous comments of 24 April 1985 (Attachment I) regarding Resource Management Objectives still apply to the Resource Use Objectives, Chapter 8 pages 8-1 to 8-3. The remainder of our comments deal with specific sections of the report, and are found in Attachment II.

If we can be of any further assistance please feel free to call.

Sincerely,

Brian S. Barnett
South Florida Section Leader

BSB/DMP/dp
attachments
copy Bradley J. Hartman
Fred Johnson
Donald Fox
Lt. Col. O. Gwynn Kelley

Attachment II

Recommended Changes to the Lake Okeechobee-Okeechobee Waterway Master Plan

ATTACHMENT II
RECOMMENDED CHANGES TO THE
LAKE OKEECHOBEE-OKEECHOBEE WATERWAY MASTER PLAN

PAGE	PARAGRAPH/ FIGURE	RECOMMENDED CHANGE/COMMENT
2-1	F-2A	Update map. This map has levees missing from Lakeport to Kissimmee River and from Nubbins Slough to Port Mayaca.
2-2	F-2B	Map of "before 1980" should show rivulets leading into sawgrass on south end of Lake Okeechobee. See Attachment III.
2-6	P 2-4.5	Rewrite this paragraph. Several misconceptions about the GFC and their role are presented in this paragraph. It was incorrectly stated that the GFC has coordinated with the Corps for maintenance of a steady lake level during the spawning season and assisted in the installation of artificial reefs in Lake Okeechobee. One of the most dynamic aspects of the lake is the fluctuation of lake levels. The GFC would welcome discussions with the Corps with regards to lake fluctuation, and a planned lake draw down could be very important for habitat improvement and thus wildlife enhancement. Fish attractors in Lake Okeechobee have not been researched by the GFC because the littoral zone, which covers over 100,000 acres, acts as a natural fish attractor. Several years ago, the GFC did obtain permits to place four sets of fish attractors in the borrow canal between Nubbins Slough and Port Mayaca, a system which has no underwater structure or littoral zone. This type of fish attractor program could be expanded throughout the approximately 100 miles of borrow canal surrounding the lake.
2-6	P 2-4.6	Change "may" to "should" in line number 12 and 23. The GFC supports the control and removal of melaleuca and Australian pine trees in the lake. Our Office of Environmental Services could be contacted for technical assistance for the selection of replacement trees and a list of native plants which are beneficial for wildlife. Other nuisance vegetation covered in this paragraph, which includes hydrilla, water lettuce, and water hyacinth, should have separate management plans. Indiscriminate control of hydrilla should be avoided. Hydrilla has been identified as the preferred plant community in the lake for overwintering waterfowl and as an extremely productive area for fish.

Any hydrilla control plan should emphasize mechanical harvesting/cutting of boat trails and major watercourse canals only. Chemical treatment of hydrilla in the Fisheating Creek area has not been effective. An aquatic plant management plan for water hyacinths and water lettuce should be developed to eliminate the chronic, indiscriminate destruction of non-target, productive aquatic habitats caused by aerial herbicide applications. This plan should follow guidelines described in the South Florida Water Management District's Aquatic Plant Work Plan with a minimum of four crews assigned to Lake Okeechobee; two from Clewiston Field Station, and two from Okeechobee Field Station. The level of infestation should never get above the acceptable level as defined in the guidelines, and EPA approved herbicides should be applied within label rates. Mechanical means should be used whenever possible to remove nuisance native vegetation from specified areas.

2-6 P 2-5.3
Add the following sentence after "Shoaling, the main ... near Ft. Myers." "The shoaling around Stuart is probably not related to the regulatory discharges of the St. Lucie Canal." This sentence comes directly from the Draft Environmental Statement Impact on Lake Okeechobee, pages 21-22.

2-7 P 2-6.4
Replace the third sentence, "Figure 2F illustrates...", with "One alternative of shoreline protection using riprap is illustrated in Figure 2F."

Eliminate the remainder of this paragraph. because it gives false statements about riprap and wildlife. First, riprap protection will not improve wildlife access to the water. In fact, the U. S. Fish and Wildlife Service is concerned that the riprap being placed around Lake Okeechobee will actually provide a barrier to aquatic turtles attempting to nest on the levee. Secondly, the surface attachment of organisms to riprap will not replace the loss of food organisms eliminated by the illustrated alternative.

2-7 P 2-6.7
Change the first sentence to read "The revetment will have some impacts on shoreline recreation and wildlife use." The riprap as designed will contribute to the decline of softshell turtles, as reported in this document, by eliminating access to over one half of the turtle's nesting ground. There are design changes which could reduce this impact, and these should be explored in depth.

2-7 P 2-6.9
Alter the last few words in this paragraph to read "by changes in the operating conditions and higher 1978 regulation levels authorized in 1968." These changes are necessary for correct sentence structure and to focus rehabilitation construction on the existing lake schedule.

2-9 P 2-9.9
Eliminate on line number 12 "the installation of fish attractors,". Add to the same sentence migratory waterfowl and alligator surveys.

3-3 P 3-8.5
Change the fourth sentence to read "In 1914 there was a dense custard ...". This change is necessary because the word "Originally" implies conditions prior to Diston's construction and other major drainage canals. See Attachment III for pre-1900 conditions.

3-6 P 3-9.4
Change last sentence to read "Recent records also show the presence of breeding populations of two exotic fishes, the black acara and blue tilapia."

3-6 P 3-9.5
Remove black crappie ("speck") from commercial species list and add them to the next sentence. Since 1981, rules have not allowed the commercial sale or harvest of black crappie.

3-6 P 3-9.10
Add to the paragraph, "Proper management could also improve migratory waterfowl and wading bird habitat." As discussed previously, the low, stable water levels have decreased plant diversity, thus reducing habitat quality.

3-7 P 3-9.15
Drop the exotic designation for the cattle egret. The cattle egret has experienced a natural range expansion to the New World, and has created little problem for native wildlife.

3-8 P 3-9.16
Change the last sentence to "Extended high regulation stages could be detrimental to the regional and migratory avifauna, as well as the resident bird, fish, reptile, and amphibian populations of the lake, since ..." This change is necessary to clarify impacts of an extended high regulation, and not limit discussion simply to the lake's bird population.

3-8 P 3-9.19
Change the second sentence to read "The following list contains species frequently associated with habitats found within the waterway". Then add the following to the mammal list:

** Everglades mink	Mustela vison evergladensis
** Florida panther	Felis concolor
** Sherman's fox squirrel	Sciurus niger shermani
** Mangrove fox squirrel	Sciurus niger avicennia

The master plan should address all of the habitats found within the waterway corridor, and not limit the discussion to aquatic wildlife.

3-9 F 3C

Change "Proposed" to "Authorized". The "Cross-Section on Caloosahatchee River" should just show the existing cross-section. The narrative which introduces this figure indicates that the figure will show the typical cross-sections. The information within the existing Caloosahatchee River cross-section clutters the figure. The extra information should be placed in the background area to show historical conditions.

4-2 P 4-5.2

Add a recommendation to this paragraph to include a comprehensive archaeological and cultural resource survey prior to any shoreline alterations, or stabilization of the river or canal. This recommendation is to ensure that no historical sites are inadvertently destroyed during improvements or maintenance operations.

5-1 P 5-2.1

The demand-supply-needs of this report are biased by the very poor figures generated within the SCORP. The SCORP is 6 years old, has a very small sample size, and was conducted during the summer when less than ten percent of lake use occurred. This entire section has major flaws because of these figures. We recommend that a user survey be conducted around the master plan area prior to the extrapolation of needs to 2030.

5-1 F 5B

Several GFC Wildlife Management Areas are not illustrated. Please revise this figure to include management areas shown in Attachment IV.

5-3 P 5-3.2

The final sentence shows the inacuracy of the SCORP report. There was an insufficient number of boat ramps during the winter season in 1986 so they could not possibly be "sufficient" through 1990.

6-1 P 6-2.1

Amend the fourth sentence to clarify that the even distribution of bank fishermen and boat fishermen is limited to the canal and river. With 90 percent of the fishing occurring in the lake, the boat fishing far surpasses bank fishing effort within the project area because more than 80 percent of the lake's fishing pressure could be attributed to boat fishing.

6-2 P 6-2.3

Delete "by local residents" in this paragraph. Duck hunting on Lake Okeechobee has a significant portion of hunters from outside the Master Plan area.

6-2 F 6C,6D

Change the labels from Commercial Fishing Areas to Haul Seine Fishing Areas. See Attachment I for correct boundaries for this area. Commercial catfish traps are legal throughout the lake where there is at least three feet of water above the trap.

6-4 F 6I

Correct this figure to show duck hunting within the marshes on the northeast and south edges of the lake. See Attachment I.

7-1 P 7-2.1

The technical support group did not meet or function any differently from any other public workshop. This group was in name only, and provided little technical support for the master plan.

8-1 through 8-3

The majority of our comments for resource objectives are outlined in our April 24, 1985 letter to Mr. Holleran (Attachment I). Many of our recommended objectives still apply to this section.

10-1

Several potential areas of recreational development are outlined in correspondence to Mr. Holleran (Attachment I). Those recommendations still apply to this section.

10-6 F 10B

We have several recommendations about Nubbins Slough, outlined in our correspondence to Mr. Holleran, which apply to problems with this proposed design. First, the fishing pier closest to S-191 is located in an area which has chronic floating aquatic plant buildups. Second, the placement of a jetty downstream of a water control structure will cause violent turbulence and erosion to the adjacent shore. Thirdly, the placement of a boat ramp between a jetty and water control structure will cause a dangerous situation. Fourth and finally, it is dangerous to have a boat ramp so close to the discharge point of a water control structure.

RESPONSES TO PUBLIC REVIEW COMMENTS

BOARD OF COUNTY COMMISSIONERS, MARTIN COUNTY

June 23, 1987

Planning Division
Environmental Resources Branch

Mr. Robert H. Oldland
County Administrator
Board of County Commissioners,
Martin County
50 Kindred Street
Stuart, Florida 33497

Dear Mr. Oldland:

Reference is made to your letter of February 25, 1987, in connection with the review of the draft Phase I Master Plan for the Central and Southern Florida Project.

All comments have been received and will be included as an addendum to the Master Plan.

As requested, you will receive a copy of the final Master Plan when complete.

Sincerely,

A. J. Salem
Chief, Planning Division

DEPARTMENT OF NATURAL RESOURCES

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

June 15, 1987

Planning Division
Environmental Resources Branch

Mr. Ney C. Landrum, Director
Division of Recreation and Parks
Department of Natural Resources
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399

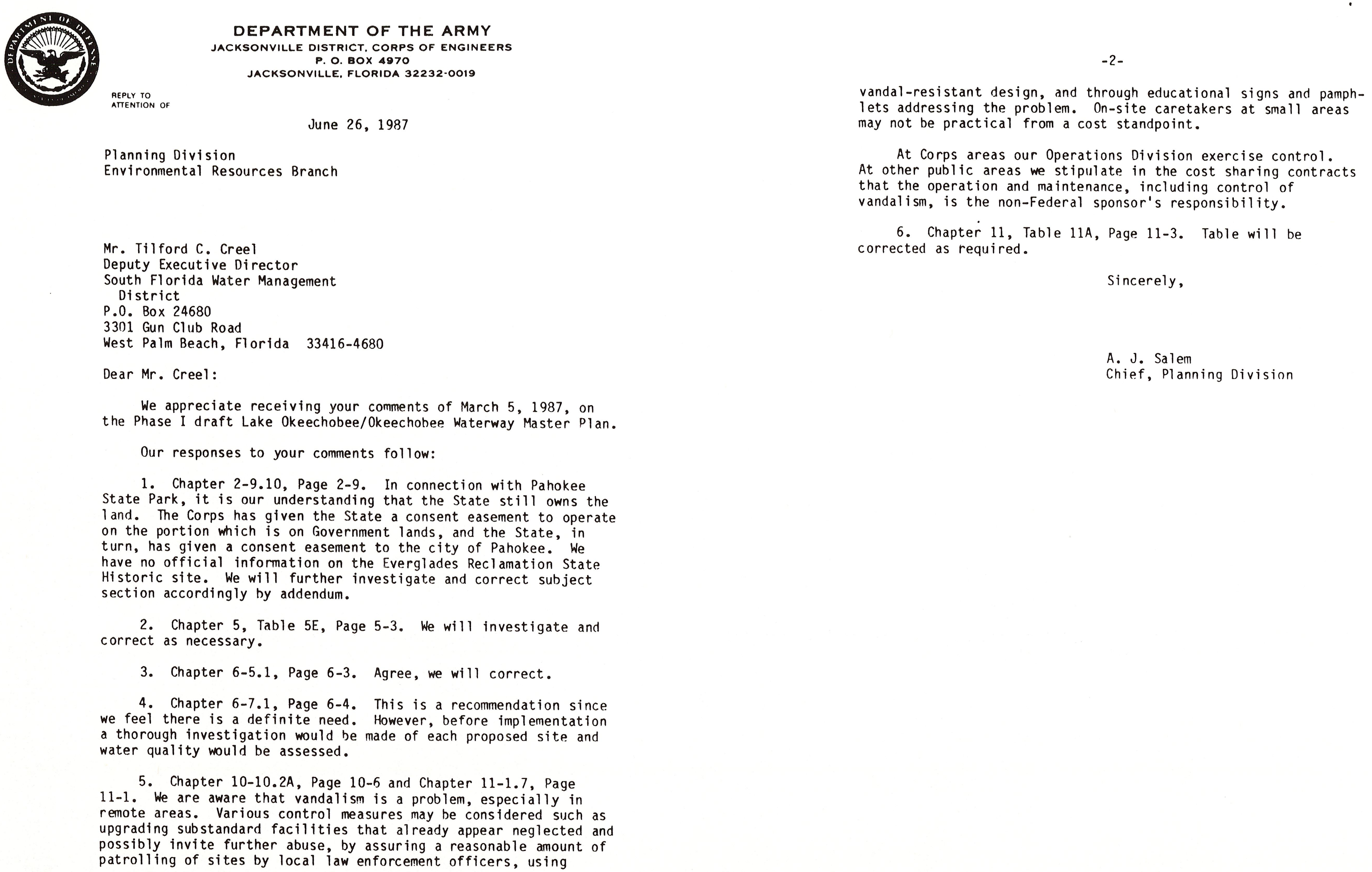
Dear Mr. Landrum:

We appreciate receiving your comments of March 11, 1987, on our draft Lake Okeechobee and Okeechobee Waterway Master Plan. We agree with your suggestion about the location of the residence/maintenance area, and be assured that before implementation of this concept it will be fully coordinated with your Division.

Sincerely,

A. J. Salem
Chief, Planning Division

SOUTH FLORIDA WATER MANAGEMENT DISTRICT



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

June 26, 1987

Planning Division
Environmental Resources Branch

Mr. Tilford C. Creel
Deputy Executive Director
South Florida Water Management
District
P.O. Box 24680
3301 Gun Club Road
West Palm Beach, Florida 33416-4680

Dear Mr. Creel:

We appreciate receiving your comments of March 5, 1987, on the Phase I draft Lake Okeechobee/Okeechobee Waterway Master Plan.

Our responses to your comments follow:

1. Chapter 2-9.10, Page 2-9. In connection with Pahokee State Park, it is our understanding that the State still owns the land. The Corps has given the State a consent easement to operate on the portion which is on Government lands, and the State, in turn, has given a consent easement to the city of Pahokee. We have no official information on the Everglades Reclamation State Historic site. We will further investigate and correct subject section accordingly by addendum.

2. Chapter 5, Table 5E, Page 5-3. We will investigate and correct as necessary.

3. Chapter 6-5.1, Page 6-3. Agree, we will correct.

4. Chapter 6-7.1, Page 6-4. This is a recommendation since we feel there is a definite need. However, before implementation a thorough investigation would be made of each proposed site and water quality would be assessed.

5. Chapter 10-10.2A, Page 10-6 and Chapter 11-1.7, Page 11-1. We are aware that vandalism is a problem, especially in remote areas. Various control measures may be considered such as upgrading substandard facilities that already appear neglected and possibly invite further abuse, by assuring a reasonable amount of patrolling of sites by local law enforcement officers, using

-2-

vandal-resistant design, and through educational signs and pamphlets addressing the problem. On-site caretakers at small areas may not be practical from a cost standpoint.

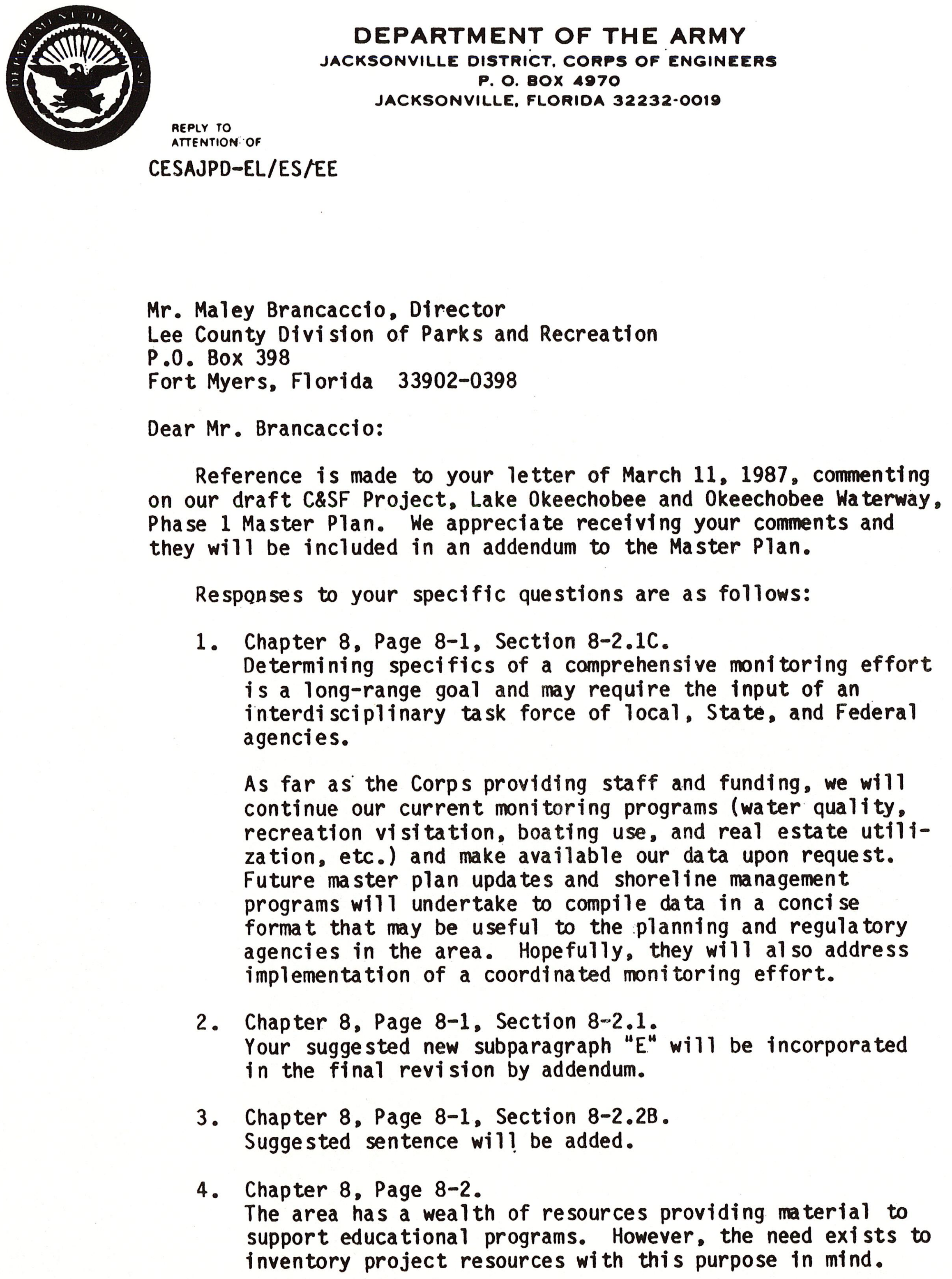
At Corps areas our Operations Division exercise control. At other public areas we stipulate in the cost sharing contracts that the operation and maintenance, including control of vandalism, is the non-Federal sponsor's responsibility.

6. Chapter 11, Table 11A, Page 11-3. Table will be corrected as required.

Sincerely,

A. J. Salem
Chief, Planning Division

BOARD OF COUNTY COMMISSIONERS, LEE COUNTY



DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF
CESAJPD-EL/ES/EE

Mr. Maley Brancaccio, Director
Lee County Division of Parks and Recreation
P.O. Box 398
Fort Myers, Florida 33902-0398

Dear Mr. Brancaccio:

Reference is made to your letter of March 11, 1987, commenting on our draft C&SF Project, Lake Okeechobee and Okeechobee Waterway, Phase 1 Master Plan. We appreciate receiving your comments and they will be included in an addendum to the Master Plan.

Responses to your specific questions are as follows:

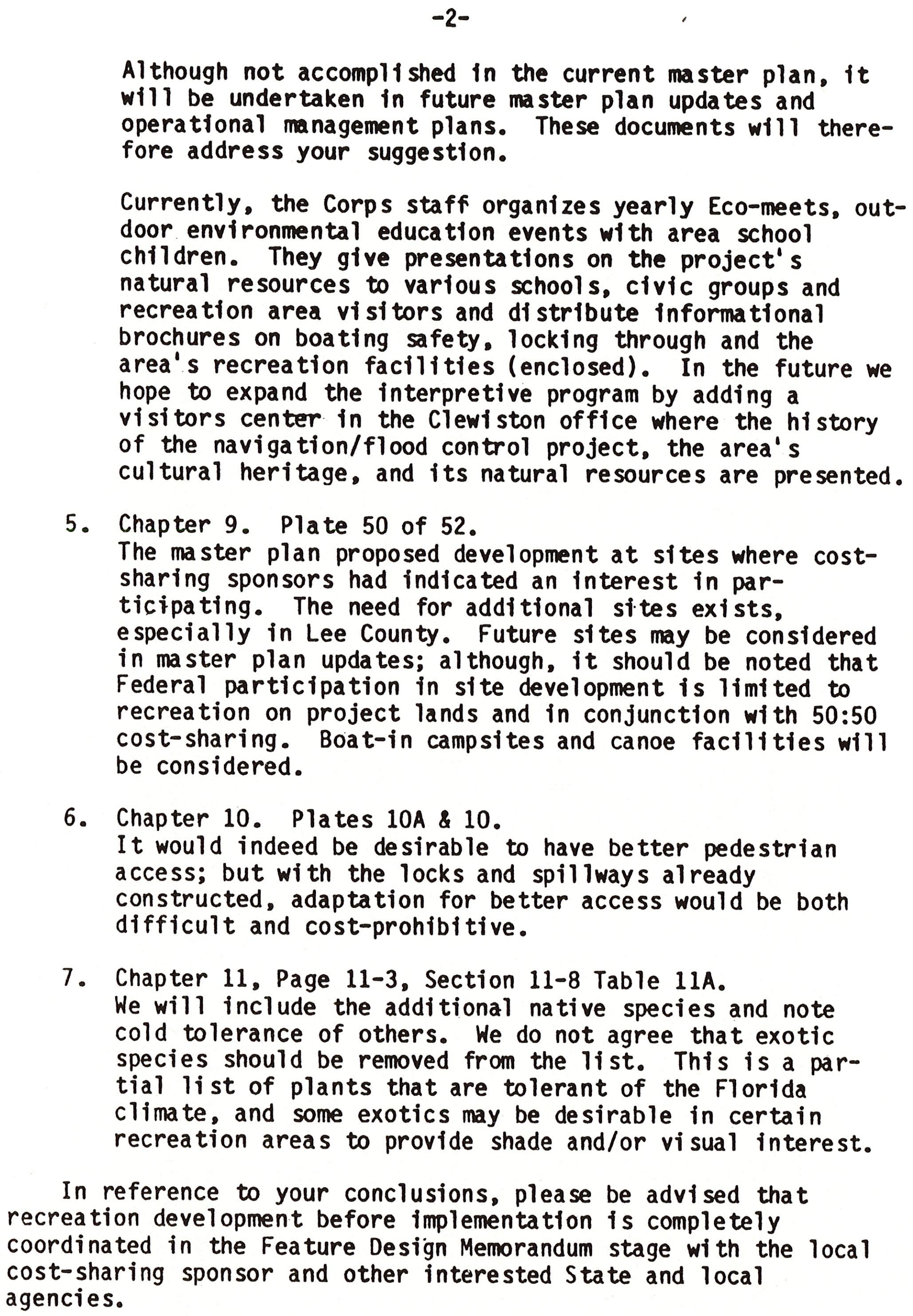
1. Chapter 8, Page 8-1, Section 8-2.1C.
Determining specifics of a comprehensive monitoring effort is a long-range goal and may require the input of an interdisciplinary task force of local, State, and Federal agencies.

   As far as the Corps providing staff and funding, we will continue our current monitoring programs (water quality, recreation visitation, boating use, and real estate utilization, etc.) and make available our data upon request. Future master plan updates and shoreline management programs will undertake to compile data in a concise format that may be useful to the planning and regulatory agencies in the area. Hopefully, they will also address implementation of a coordinated monitoring effort.

2. Chapter 8, Page 8-1, Section 8-2.1.
Your suggested new subparagraph "E" will be incorporated in the final revision by addendum.

3. Chapter 8, Page 8-1, Section 8-2.2B.
Suggested sentence will be added.

4. Chapter 8, Page 8-2.
The area has a wealth of resources providing material to support educational programs. However, the need exists to inventory project resources with this purpose in mind.



-2-

Although not accomplished in the current master plan, it will be undertaken in future master plan updates and operational management plans. These documents will therefore address your suggestion.

Currently, the Corps staff organizes yearly Eco-meets, outdoor environmental education events with area school children. They give presentations on the project's natural resources to various schools, civic groups and recreation area visitors and distribute informational brochures on boating safety, locking through and the area's recreation facilities (enclosed). In the future we hope to expand the interpretive program by adding a visitors center in the Clewiston office where the history of the navigation/flood control project, the area's cultural heritage, and its natural resources are presented.

5. Chapter 9. Plate 50 of 52.
The master plan proposed development at sites where cost-sharing sponsors had indicated an interest in participating. The need for additional sites exists, especially in Lee County. Future sites may be considered in master plan updates; although, it should be noted that Federal participation in site development is limited to recreation on project lands and in conjunction with 50:50 cost-sharing. Boat-in campsites and canoe facilities will be considered.

6. Chapter 10. Plates 10A & 10.
It would indeed be desirable to have better pedestrian access; but with the locks and spillways already constructed, adaptation for better access would be both difficult and cost-prohibitive.

7. Chapter 11, Page 11-3, Section 11-8 Table 11A.
We will include the additional native species and note cold tolerance of others. We do not agree that exotic species should be removed from the list. This is a partial list of plants that are tolerant of the Florida climate, and some exotics may be desirable in certain recreation areas to provide shade and/or visual interest.

In reference to your conclusions, please be advised that recreation development before implementation is completely coordinated in the Feature Design Memorandum stage with the local cost-sharing sponsor and other interested State and local agencies.

-3-

You will receive a final version of the Master Plan when completed.

Sincerely,

A.J. Salem
Chief, Planning Division

FLORIDA GAME AND FRESH WATER FISH COMMISSION

Planning Division
Environmental Resources Branch

Mr. Brian S. Barnett
South Florida Section Leader
Florida Game and Fresh Water Fish Commission
Post Office Box 1840
Vero Beach, Florida 32961-1840

Dear Mr. Barnett:

Reference is made to your letter of March 23, 1987, commenting on our draft "Phase I Master Plan for the Central and Southern Florida Project".

Your comments have been noted, and where appropriate will be incorporated by Addendum in the Final Master Plan.

We appreciate your thorough review of this Master Plan.

Sincerely,

A. J. Salem
Chief, Planning Division

Phase 1
C&SF Master Plan

1986